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and
AIRCRAFT ENGINEER

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The Outlook

Only Thirty Years Ago

IT was a happy thought on the part of the United States Navy authorities to send over the Lockheed P2V Neptune, *The Turtle* (commonly called the *Truculent Turtle*), with Rear-Admiral Read on board, for, almost to the day, it is thirty years since he made the first flight across the Atlantic. That flight was a long way from being a non-stop one. The honour of the first direct hop across fell to two Englishmen, Alcock and Whitten-Brown, some little time afterwards, when they crossed from Newfoundland to Ireland in just over 16 hours.

The American attempt was a long drawn-out affair, with plenty of delays and mishaps. Four machines were concerned in the attempt, but only that piloted by Lt.-Cdr. Read, as he then was, got as far as England. The other three machines had engine trouble and abandoned at various stages. So had Read, but ultimately he reached Plymouth.

Vast preparations had been made for the crossing, and the U.S. Navy had destroyers, battleships and cruisers, as well as a couple of tankers, strewn along the route. The machines were of the N.C. (Navy-Curtiss) type. N.C.1, 2 and 3 had three Liberty engines; N.C.4 (piloted by Lt.-Cdr. Read) had four. They left Rockaway, N.Y., on May 8th, 1919, and N.C.4 had engine trouble and landed at Chatham, Mass. Not until May 14th did it get to Halifax; Trepassy, Newfoundland, was reached on May 15th. The start on the Atlantic flight was made on May 16th, and N.C.4 reached Horta in the Azores, on May 17th, having taken 15 hours 19 minutes to cover the 1,380 miles. It made Lisbon on May 27th, left again on May 30th, landed with engine trouble, got away again and alighted at Ferrol, where the night was spent. Leaving Ferrol at 6.27 a.m. on May 31st, the machine circled Drakes Island and landed at Plymouth at 1.26 p.m.

When looking back to this crossing of the Atlantic, and bearing in mind that the *Turtle* brought Rear-Admiral Read over the same route in 20 hours' flying time, it is difficult to realize that only 30 years have elapsed, and the P2V is a slow aircraft according to modern standards, designed for long-range patrol (it holds the world's long-distance record with 11,236 miles) and not for speed. Transport aircraft cross the Atlantic direct every day in not much more than half the time. Great improvements have been made in aircraft design, but first and foremost have we to thank the reliability of modern power plants and the large reserve of power for the regularity with which aircraft cross the Atlantic thirty years after that first hazardous adventure.

1052 and All That

SUPERSTITION has it that Friday the 13th is an unlucky day, and there are doubtless those who believe that this had something to do with the fact that Mr. Wade's flight from London to Paris, on May 13th, took just a little longer than had been expected. The fact is, of course, that the weather was very far from being ideal for such a fast aircraft. The air was turbulent and visibility none too good, factors which can cause delays that are small in themselves but important on a flight in which seconds count. As it was, Mr. Wade took the Hawker 1052 across from London Airport to Villacoublay at approximately 618 m.p.h., a figure which can doubtless be increased in better conditions, since the 1052 should be a good deal faster than the Gloster Meteor 4 on which Waterton flew from Le Bourget to Croydon at 618.4 m.p.h. in 1947. At any rate a first official record has been set up (whatever the exact speed homologated by the F.A.I.) which will no doubt start a whole series of attempts.

In this connection it is worth while recalling that the very first non-stop flight between London and Paris air-

fields was made in April, 1911. The machine was a Blériot monoplane with 80 h.p. Gnôme rotary engine, and the pilot was M. Pierre Prier. Starting from Hendon he landed at Issy 3h 56min later. Curiously enough, he too found the French capital shrouded in mist, and to such an extent that even the top of the Eiffel Tower could not be seen. Prier's average speed was about 64 m.p.h.

Other worthwhile records were set up by Mr. N. Duke on a Hawker Fury, when he flew from London to Rome in 2 hours 31 minutes 51 seconds, and from London to Karachi in 15 hours 24 minutes. Enthusiasm for our new jet fighters should not blind us to the fact that British piston-engined fighters can still give a good account of themselves, and that they can, should the need arise, be flown to distant parts of the world in a very short time, and in long non-stop stages. The Bristol-Hawker combination has done as well in its own class as the new Hawker-Rolls-Royce in the more modern category.

The Evidence at Orly

SOME eighteen months ago, following inspection of a number of factories and research establishments in France, we published a short series of articles on the revival of the French aircraft industry; and the views which we expressed concerning that industry's progress and potential were regarded by some people as optimistic. No one could continue to hold that opinion after having watched the Orly display which marked the culmination of the two-week International Paris Exhibition. It is, in fact, high time that this country realized that France has again become a first-line power in the world of aircraft construction, and one capable of offering formidable competition in all markets. Such is the complexity of the modern aircraft and the organization required to design, build, test and produce it that very few nations can now hope to build up the necessary specialized industrial capacity. The French industry is comprehensive, vital and self-supporting.

France's achievement at Orly can be justly described as a modest triumph. Aircraft that for the past many months have been little more than figures and numbers in British minds (France was ever slow to provide air photographs) have now been demonstrated as advanced and purposeful prototypes and production aircraft. In particular, a long-range airliner of a size between Constellation and Brabazon has taken the air; a half-scale model of France's S.R.45 counterpart is building up much air experience; several advanced jet-prototypes are flying and a series of small and medium-sized passenger aircraft hold out great promise. Moreover, the French show signs of leading the world in the construction of very large freighters.

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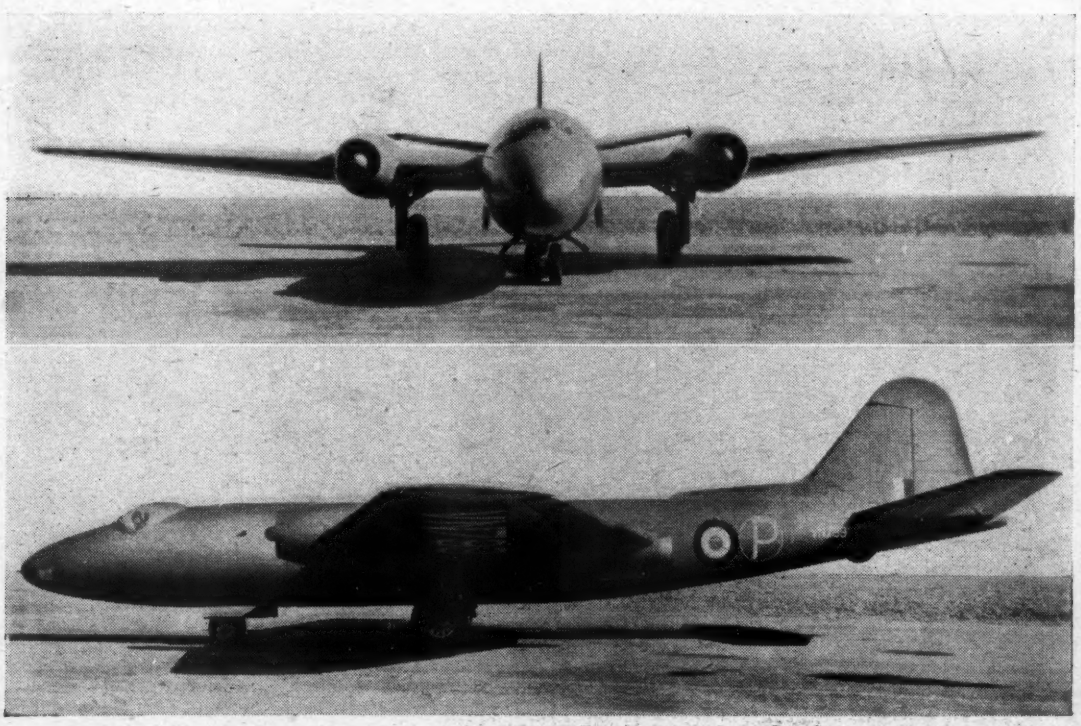
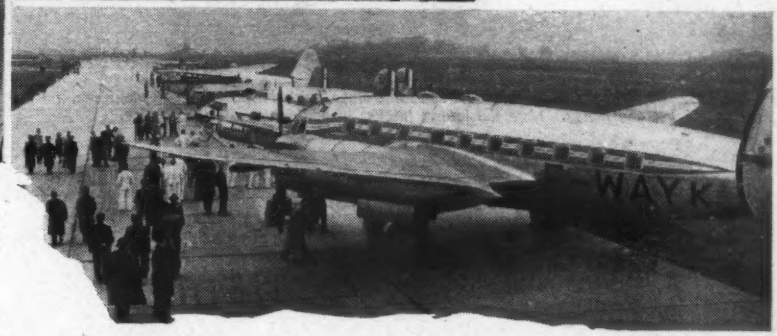


FOR LIGHTNING RAIDS: Britain's first jet bomber—the English Electric A.1, with two Rolls-Royce Avons—made its maiden flight, in the hands of W/C. R. P. Beamont, D.S.O., D.F.C., on Friday, May 13th. These official photographs—the only two released—indicate a very clean design, with wing and tail surfaces of unusually low aspect ratio.



Well-organized Flying Display as Culmination of Paris Show

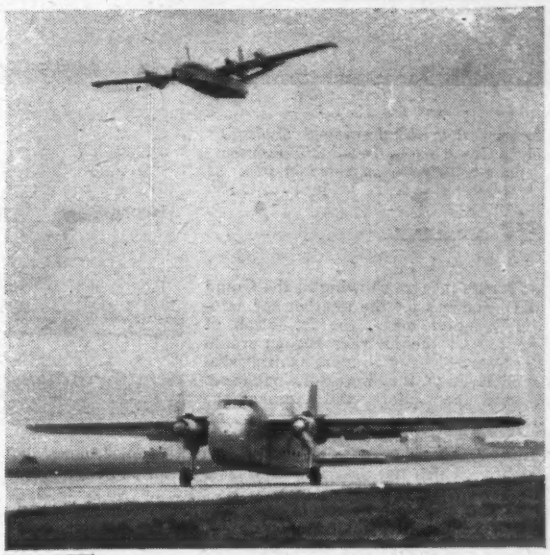
ORLY

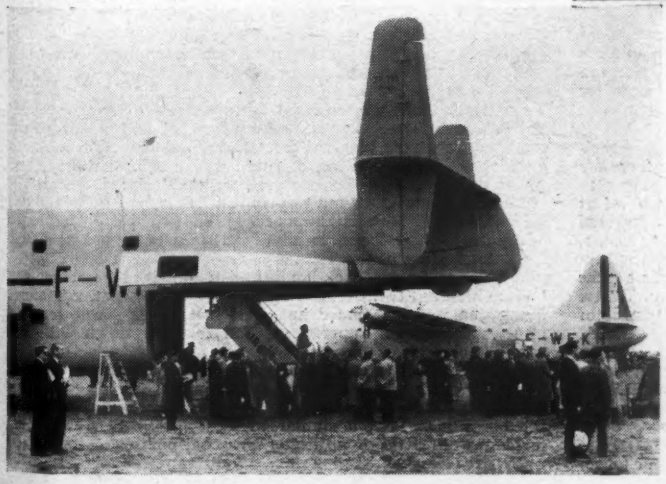
Illustrated by "Flight" Photographs

IT has been said that no other country in the world stages an air display and exhibition to compare with that of the S.B.A.C. This we believe to be true, but the excellence of the 1949 Paris Show and its culminating air display at Paris-Orly Airport deserve the highest praise, staged, as they were, by a country whose aviation industry, unlike our own, has up to now been grappling with the task of recovery from complete wartime dislocation. No fewer than 26 French aircraft, the majority entirely new (with several too large for exhibition in the Salon), took part in the flying display. They included examples from almost every class: helicopters, trainers, medium and very large airliners and freighters, research types and jet fighters. Of particular interest as indicating the capabilities of the French manufacturers were the prototype S.E.2010 Armagnac 80-seater long-range airliner (in the Stratocruiser class with a span of 160.5ft) and the Dassault 450 Ouragan intercepter with Nene turbojet—France's most businesslike and promising jet fighter to date.

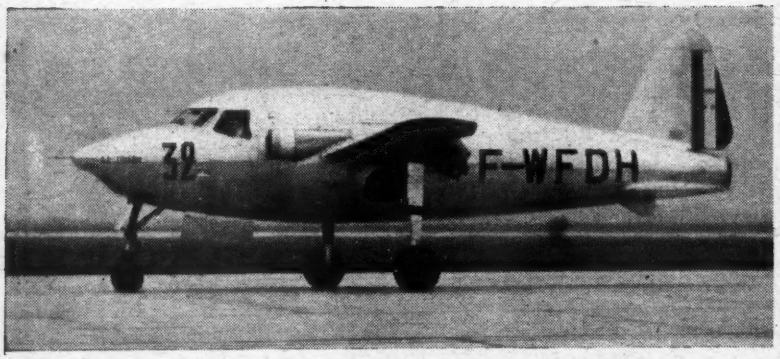
The display opened on the morning of Saturday, May 14th, with a ground exhibition of the aircraft taking part in the flying display. Entrance was limited to ticket-holders, the general public having an opportunity to examine the aircraft on the following day. The flying display was preceded by an official luncheon, at which the hosts were M. Georges Hereil, President of the Union Syndicale des Industries Aeronautiques, and M. Raymond Saulnier, President of the Executive Commission of the 18th Salon International de l'Aeronautique. Among the 2,000 guests in the hangar used for the function was Lord Pakenham; he was lunching with M. Christian Pineau, the French Minister of Works and Transport.

Weather could hardly have been poorer without actually preventing the flying from taking place. It was dry, but the light was so bad, due to a heavy haze, that airfield runway and obstruction lights were necessary to guide the pilots. The British industry made up in

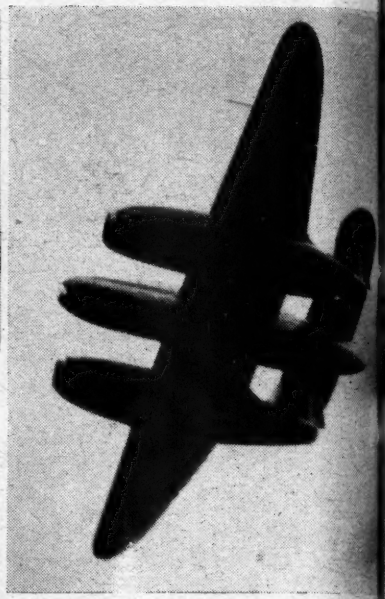




The general views at the head of the page are typical. Above is the S.E. 1210 scale-model flying boat over the redoubtable Bristol 170; at left the access end of the double-deck Breguet 761 and the N.C. 211 Cormoran heavy freighter.



The S.O.6000 Triton side-by-side dual-control trainer, with Hispano-Rolls-Royce Nene, is fast and handy. Note the lateral intakes in addition to the nose orifice.



Two Nenes power the strange multi-purpose N.C.1071 (above). This type is the forerunner of an all-weather fighter of similar layout. Below is the capacious N.C.211 Cormoran freighter.

By comparison with the example displayed in the Grand Salon, the S.O.6020 Espadon flown at Orly had increased fin area.

Orly . . . . .

part for its meagre showing in the Grand Palais, and but for the weather the aerobatic Vampire team, the formation of Meteors and the Hawker P.1052 would have been able to give more exciting displays. Even so, they were quite outstanding, and their pilots, and those of the French jets, are to be congratulated on agreeing to fly at all in such conditions.

Less hampered were the Bristol 171 helicopter, and the Freighter, which not only flew convincingly on one engine but delighted the crowd, most of whom would not have seen it before, by disgorging three jeeps. The heavy-bomber formations, Lincolns and American B.29s, did well to arrive overhead in time, but they were obviously handicapped in the semi-overcast twilight.

The flying programme, well organized and with exceptionally good timing, started with the helicopters, the two-rotor French S.E.3000 (1,000 h.p. Bramo Fafnir), the Bristol 171 and the Westland-Sikorsky. Each executed movements for which they were never intended, as is now the custom with helicopter demonstrations.

A small flock of light aircraft followed the helicopters, wheeling around the sky and demonstrating their qualities for *école* and *tourisme*. In this class the French have much more to offer than the British, and one could not help but marvel at the performance and manœuvrability of modern low-powered two-, three- and four-seaters. The N.C.853, S.I.P.A. S.901, both with 75 h.p. Minies, and the S.O.7060 Deauville (105 h.p. Walter Minor), all French-built, were joined in the air by the Czech Zlin 22 (75 h.p. Praga) and Sokol M.1C (105 h.p. Walter Minor) and two smaller military trainers—the S.11 Instructor and Beechcraft 45 Mentor—from Holland and the U.S.A. respectively.

The two attractive light transports next on the programme were appropriately called Colonial Twins, being all-metal four-seaters. One, the Czech Aero 45, has two Walter Minors and the other, the Morane 700, two 160 h.p. Potez units.

France's new Nene-powered fighters—the Dassault M.D.450 Ouragan interceptor and S.O.6020 Espadon, designed for longer range—were performing for the first time in public. Billed with such star-turns as the Vampire aerobatic team of No. 54 Squadron, a Meteor formation (No. 66 Sqn.) and the Hawker P.1052, they acquitted themselves well, if their brief development background was borne in mind. The Ouragan showed from the moment its wheels left the runway—in a creditably short distance—that in rate of climb and turn, landing speed and general handiness it is much closer akin to British contemporaries than the heavy Espadon, which climbed somewhat sluggishly from take-off and never really seemed to get into its stride, though obviously fast.

From the same nationalized factory as the Espadon came the S.O.6000 Triton, with its plump fuselage and astonishingly small wings. This two-seat jet trainer (likewise with a Nene) gave a dashing exhibition of speed and manœuvrability, but its landing, like that of its stablemate, was decidedly "hot."

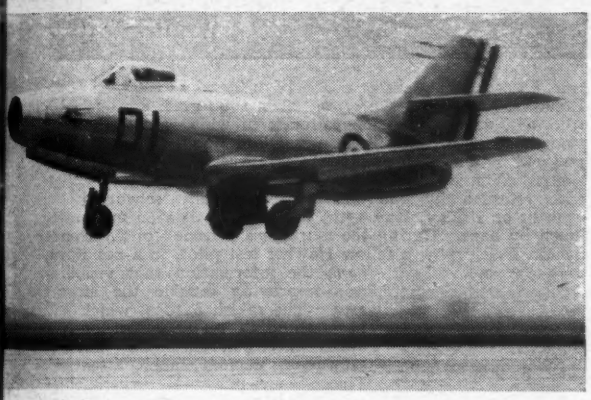
The pilots of two military piston-engined trainers, the S.I.P.A.11 and Morane Saulnier 475, shower special aerobatic adroitness, but if these are advanced trainers we are at a loss for a description of the Triton.

Developed from a deck-landing piston-engined machine, the bizarre-looking twin-Nene N.C.1071 possesses unusual slow-flying qualities; it seemed happiest, in fact, at the lower end of its speed range, approaching and touching down with becoming sobriety.

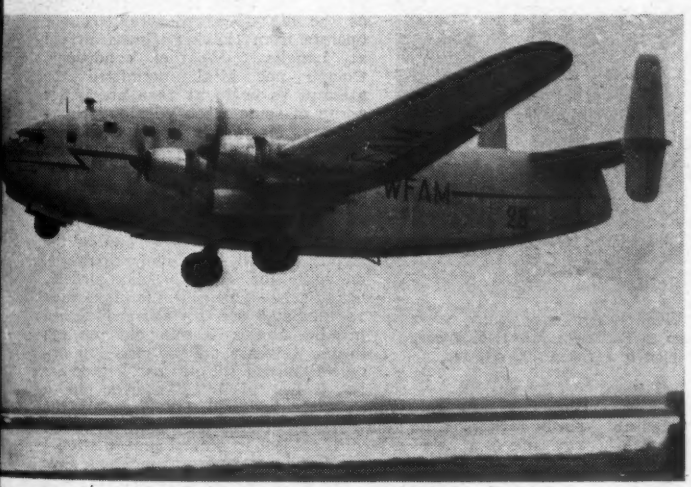
Though Britain's crack Meteor and Vampire teams did not disappoint, despite meteorological set-backs, the station-keeping of the six Bomber Command Lincolns was hardly worthy of the occasion. That a similar formation of U.S.A.F. Superfortresses did little or no better was cold comfort.

In the Hawker P.1052 Mr. Wade repeated the rythmic

Comparable with the Boeing Stratocruiser, and similarly powered with Pratt and Whitney Wasp Majors, the new S.E.2010 Armagnac is a credit to France's aircraft industry. Twenty-five examples are on order for Air France.



The compact and handy M.D.450 Ouragan (above) was one of four French jet aircraft with Nenes. Below is the very promising Breguet 761 double-decker.



repertoire he evolved for his P.1040 demonstrations. His fast, sustained rolls made a special appeal to the Parisians.

By courtesy of the U.S. Navy, in the person of Lt. Cdr. Davies, a *Flight* representative flew in the record-breaking Lockheed P2V, *The Turtle*, in its demonstration of rocket-assisted take-off. The Commander "hit the JATO" with about 45 knots on the clock, and the 47,000 lb *Turtle*, reacting smoothly to 4,000-lb of jet urge, went kiting up at some 3,000 ft/min. Exercising a turtle prerogative, it turned, and showed that, on piston-engines alone, it has speed and agility.

In the absence of a Shooting Star the U.S.A.F. was represented by a massive Douglas Globemaster transport, the yawning door of which swallowed sightseers by the hundred.

Two pure-research aircraft performed—the H.D.10 single-seat flying model for an aircraft of extreme aspect ratio, and the S.E.1210, a small-scale precursor of a very large trans-oceanic flying boat. The H.D.10 weighs only 1,060 lb and has an aspect ratio of 32.5. It flew well, but landed fast.

Two appealing light amphibians, the Piaggio P.136 and the S.C.A.N.30, next took the air. The Italian has two 215 h.p. Franklins and the French machine two 220 h.p. Mathis vee-eights. The Piaggio has the more attractive appearance, but was somewhat more laboured and noisy in its take-off and climb; both aircraft, however, performed well.

In the general classification of transports, the first to be airborne was the C.M.100, quickly followed by the Nord 2100 twin-engined pusher, both of which aircraft give evidence of becoming successful types. The Dassault 315 took-off and performed its display on the starboard engine alone, and on landing was brought to rest in about 170 yards by use of its braking airscrews.

Named Corse II, the S.O.95 clearly showed those qualities which have already given it such an excellent record, after which the appearance of a hare streaking down the runway enlivened the attention of the massing spectators for demonstration of the S.O.30P Bretgane. The handling qualities of this good-looking and extremely workmanlike aircraft were shown by 70-deg banks without trace of lost height or instability.

Britain's Freighter

The only British transport demonstrated (in exemplary manner, be it said) was the Bristol 170 Freighter, which was to have been followed by the Breguet 892 Mercure. Evidently, however, there was something wrong with the latter, for the pilot merely taxied the aircraft away.

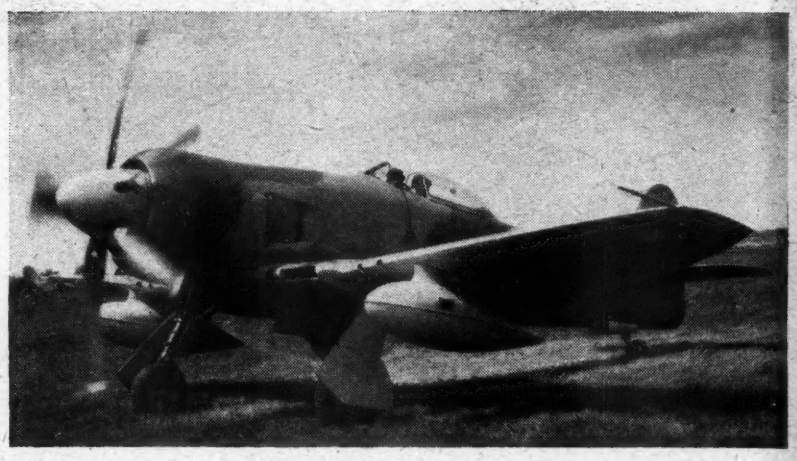
The slim-bodied, pressurized, S.E.1010 photographic survey aircraft contrasted with the more corpulent transports. This machine is peculiar in employing Mercier wing-tip ailerons, the effectiveness of which was convincingly demonstrated by large roll-angles without visible trace of slewing or directional deviation.

Perhaps the most impressive French aircraft displayed at Orly was the S.E.2010 *Armagnac*. The true size of this machine is belied by its particularly graceful shape; first flown on April 2nd this year, it was patently an achievement of which every Frenchman at the display was deservedly proud. *Armagnac* heralded the appearance of the large types, for it was followed by the 44-tonne Breguet 761 Deux Ponts, which left the ground surprisingly quickly and impressed everybody considerably by flying past with both its port airscrews feathered. The N.C.211 Cormoran lumbered rather slowly into the air, its enormous fuselage volume being emphasized by the rather high aspect-ratio wing. As it flew past with the outboard port airscrew feathered the big Breguet 761 landed and, using reversed airscrew thrust, demonstrated its ability to stop in a very short distance indeed.

Although the public were admitted for the display on Saturday afternoon it was not until the following day that they were able to examine the various aircraft at close quarters.

HAWKER HAT-TRICK

Three Point-to-Point Records Set Up Within Two Days



Mr. Neville Duke gives the Centaurus of his record-breaking Fury a run-up before leaving Langley for London Airport, the starting-point for both flights.

EXCELLENT performances by two aircraft—both fighters, though to very different specifications—and their pilots last week gained for Hawker Aircraft, Ltd., the distinction of capturing two national point-to-point records and establishing another for the first time.

Subject to F.A.I. confirmation, Mr. Neville Duke now holds the London-Rome, London-Karachi records, and Mr. T. S. Wade the London-Paris. But for meteorological setbacks, Mr. Wade would doubtless have "bagged" a fourth record on his way back.* The superstitious may hold the day and date of his departure responsible for this misfortune.

The Fury was originally due to leave London Airport on May 10th at 0400 hr. A minor snag with one of its two 90-gall wing tanks caused a day's delay, and when better weather conditions were forecast for May 12th it was decided to wait a further 24 hours. The actual time of take-off was 0403 hr, and the Fury touched down at Urbe, near Rome, 3 hr 3 min later. Hawker officials waiting in London to hear news of success suffered a brief period of near-anguish. Fog in Rome had prevented Mr. Duke from landing at Ciampino, and, it was feared, might also have prevented the timekeepers there from recording the moment of arrival. In addition, quick-refuelling facilities had not been arranged at Urbe, so that the London-Karachi time was also imperilled.

Shortly afterwards, however, word came that the Fury had been seen by the Ciampino observers, who calculated the London-Rome time of flight as 2 hr 31 min 51 sec—almost 20 min faster than the record for the 908.3-mile journey established last November by Mr. John Derry in a Vampire 5. Refuelling took up little more than the allotted hour, as the Fury left for Nicosia, Cyprus, at 0815 hr. This second (1,222-mile) "leg" was completed at an average speed of 376 m.p.h., and after further replenishment of the Fury's tanks Mr. Duke took off again within the half-hour for Bahrein in the Persian Gulf. Undisturbed by increased heat—and, towards the end of the flight, by darkness—Mr. Duke maintained his high average speed right through to Karachi, where, on arrival, he was greeted by A.V-M. R. L. R. Atcherley, Chief of the Royal Pakistan Air Force, to which the aircraft (one of a number) was thus delivered. Including the three halts for refuelling, time taken for the 3,938-mile journey from London was 15 hr 24 min, an average speed of 256 m.p.h. The official record of 19 hr 14 min for this route was established by an R.A.F. Lancaster in 1946.

Before joining Hawker Aircraft, in May, 1948, as No. 2 experimental test pilot, Mr. Duke spent two years as a squadron leader at Boscombe Down. His confirmed wartime victories as a fighter pilot total 28, and he holds the D.S.O., D.F.C. and two Bars, and Czech Military Cross. After a course at the Empire Test Pilots' School at the end of the war, he became a member of the High Speed Flight with G/C. Donaldson and S/L. Waterton, when the former established a record of 616 m.p.h. The aircraft in which Mr. Duke flew from London to Karachi was a standard Hawker Fury F.B.60, powered by a 2,550 h.p. Bristol Centaurus 18.

Mr. "Wimpey" Wade's departure from Heathrow was likewise retarded by the weather. Originally scheduled for 0730 hr on Friday, May 13th, take-off was delayed until after lunch by haze. During the morning a "recce" of the course by Mr. F. Murphy, a fellow Hawker test pilot, in a Sea Fury, gave the information that visibility was improving outside the airport area. The rakish P.1052, which had been standing under guard on the apron extension since the previous afternoon, excited much attention. This Nene-powered experimental fighter has made only one previous appearance in public, at the recent Woodford display, where it was flown by F/L. Duke. All test flights have so far been made from Farnborough as the high-speed prototype cannot operate from Hawker's grass airfield at Langley. Weather conditions, though not ideal, permitted the attempt to begin at 1430 hr. After a run of some 1,500 yd along No. 1 runway, Mr. Wade began a shallow high-speed climb to take up course and make a 300-ft run across the airfield for the timekeepers. The P.1052 vanished in the haze almost immediately. Three minutes later it streaked across the west end of the airport guided by signal cartridges, *en route* for Villa Coublay airfield, near Paris. This 221-mile flight took 21 min 27.8 sec, an average of 618 m.p.h., and a 6 min 9.7 sec/153 m.p.h. increase on the standing unofficial record set up last September by S/L. "Bill" Waterton in a Meteor 7. As Mr. Wade's flight is the first attempt on the newly authorized London-Paris point-to-point record, however, any time establishes a record, subject to official confirmation.

Piloting the P.1052 experimental fighter on its 618 m.p.h. run to Paris was Mr. T. S. Wade, chief test pilot of Hawker Aircraft, Ltd.

Initial signals received at London Airport from Paris gave an incorrect time of over 24 min, for which corresponding speed is about 550 m.p.h. Quick calculations on these lines doubtless prompted the observation attributed to Mr. T. O. M. Sopwith—"It should have been 100 m.p.h. faster." The pilot himself was positive that a higher speed could have been reached in more satisfactory conditions.

The fastest return flight was also made by S/L. Waterton, at a speed of 618 m.p.h. in a Meteor 4, flying from Le Bourget to Croydon in January, 1947. It was intended to exceed this in establishing the Paris-London record, but last Saturday evening, when the P.1052 was awaited at London Airport, word came that conditions in France had held up the take-off. Furthermore, poor weather was forecast for the following few days, so that speed aspirations had to be abandoned, the aircraft returning to London at a more leisurely pace (in 23½ min) last Sunday.

CHANGE OF EDITORSHIP

Retirement of C. M. Poulsen : Appointment of Maurice A. Smith

NEXT month, after nearly forty honourable years devoted to the encouragement and development of flying, C. M. Poulsen, the Editor of *Flight*, is retiring. He will be greatly missed by his colleagues, who have learned to appreciate his outstanding qualities and quiet, friendly disposition.

Carl Marcus Poulsen was born of farming stock at Aalborg, in Jutland, Denmark, sixty-five years ago, emigrated to America at an early age and worked in Virginia at the time when the Wright Brothers were experimenting in the neighbouring State of North Carolina. That fortuitous circumstance started his enthusiasm for aeronautics. Returning to Europe, he became a premium pupil to a Gloucester firm which was building a tandem monoplane, but the aircraft was not a success, and young Poulsen lost his job—and his premium. In 1911 he answered an advertisement for a post in *Flight's* drawing office, quickly progressed to the editorial side, and, during the first world war, became Technical Editor, under the late Stanley Spooner, who was then Editor and proprietor. Some years later Geoffrey Smith, Editorial Director of Iliffe and Sons, Ltd., entered into an agreement on behalf of that firm to take over *Flight* when Mr. Spooner should decide to retire; meanwhile, he acted for several years as adviser to Mr. Spooner.

Wing Cdr. Maurice A. Smith, D.F.C.

In 1934 the journal was finally acquired by Iliffe and Sons and transferred, with its staff, to Dorset House, the present publishing office. Mr. Poulsen was thereupon appointed to the Editor's chair, a position he has occupied with distinction ever since. Throughout this period he has kept in the closest possible touch with every technical advance in the field of aviation, and has been a notable champion of the cause of the flying boat and of rotating-wing aircraft. His long connection with the aeronautical movement has brought him a host of friends who have constantly sought his advice and opinion and who, like his colleagues in Dorset House, will greatly regret his retirement.

Succeeding Mr. Poulsen as Editor is Maurice A. Smith, formerly Wing Commander, R.A.F.V.R., who during the war gained the D.F.C. and bar for his exploits as a master bomber. His flying career started while at Wadham College, Oxford, when, in 1933, he trained as a pilot with the University Air Squadron. He was subsequently commissioned in the R.A.F. Volunteer Reserve, and also received practical engineering training in the aircraft-engine production shops of Rolls-Royce, Derby, before joining the editorial staff of *Flight*, and later assisting in launching our sister journal *Aircraft Production*. Serving throughout the war in the R.A.F. he flew nearly every training type as well as several four-engined and fighter aircraft before operating on Lancasters and Mosquitoes. He returned to *Flight* on his release and was appointed Assistant Editor. His log shows appreciably over 3,000 hours' flying, and during the last two years he has piloted thirty different types of civil and military aircraft, including jet fighters, recording in our pages his experiences with most of them.

Mr. C. M. Poulsen.

Associate of the Royal Aeronautical Society and a member of the Royal Aero Club, he was elected in April to the Freedom and Livery of the Coachmakers and Coach Harness Makers Company. He also remains an active member of the R.A.F.V.R.

An experienced staff of specialist writers collaborates in the production of *Flight*. Assistant Editor will be H. F. King, whose work in connection with Technical Intelligence while serving as a Squadron Leader in the R.A.F.V.R. earned him the M.B.E.; Roy Casey (who was also a Squadron Leader in Intelligence) is Chief Sub-Editor; C. B. Bailey-Watson, B.A., who was engaged in flight development work during the war, is responsible, in particular, for technical descriptions; Roy Pearl, formerly a Squadron Leader flying in Coastal Command, and still a V.R. pilot, has charge of the Commercial Aviation section; and R. Blackburn assists H. F. King. On the illustrative side, John Yoxall, whose library of flying photographs from the earliest days is unequalled, continues in charge, assisted by L. W. McLaren. To complete the picture, the fine sectional and perspective drawings, which, introduced by Dorset House, have helped to make *Flight* and its sister journals famous throughout the world, remain in the hands of Max Millar and his team of capable assistants.

TROPICAL TESTS FOR A PRINCE

PERCIVAL Prince G-ALFZ, fitted with two Alvis Leonides engines, left England on March 1st and was due back in Luton one day this week, after completing a 25,000-mile round tour of Africa. During the tour the aircraft was subjected to tropical tests at Khartoum, Nairobi, Johannesburg and Accra on the west coast of Africa. In a matter of some 150 hours' flying it travelled through France, North Africa, Egypt, Sudan and Uganda, Kenya, Tanganyika, North and South Rhodesia, Union of South Africa, Portuguese East Africa, the Belgian Congo, French West Africa, the Gold Coast, Sierra Leone, French Equatorial Africa, Morocco, Portugal and Spain.

In charge of the tour was Mr. D. M. Bay, assistant sales manager of Percival Aircraft; he flew as co-pilot with Capt. R. W. Hornall, of Hunting Air Travel, who are associated with Percival Aircraft in the Hunting Group of companies. The radio operator was Mr. J. Proctor. Other occupants of G-ALFZ were Mr. Lenton, of the Alvis Company, Mr. K. Roberts, senior inspector of Percival Aircraft, and Mr. J. Retulski, flight-observer of Percival Aircraft.

The test flying at Accra was conducted by one of the firm's test pilots, Mr. R. Weldon. The flight was carried out under arduous conditions without incident, and the aircraft is stated to have behaved splendidly.

HERE AND THERE

QUID PRO QUO: After a flight in the Westland-Sikorsky S-51 from the Invalides helicopter landing-ground, next door to the Paris Exhibition, Lord Pakenham, Minister of Civil Aviation, is seen with his opposite number in France, M. Pineau (who not long ago visited this country) and Mr. A. S. Lemaitre, controller of ground services, M.C.A. Lord Pakenham was on the Continent to discuss civil aviation affairs of mutual interest to Britain, France and Belgium. The Westland helicopter made many flights over Paris during the Orly week-end.

A New Forest

BERLIN'S woodland areas have suffered badly through the need for fuel during the Russian blockade. An unusuál load recently carried by an R.A.F. Hastings from Schleswigland consisted of 2,000,000 pine seedlings, weighing seven tons, which are being planted in the Grünewald as part of a general reafforestation programme.

Skywriting Dispensation

THE ban on skywriting, announced in these columns recently, is to be specially relaxed for aircraft taking part in the Church of England's "Mission to London." Dr. Wand, the Bishop of London, has announced that aircraft will make smoke crosses in the sky over Bethnal Green, Paddington, Edmonton, and other parts of the capital.

Radio "Strike Recorder"

A NEW system for recording the results of armament practices has been accepted by the Admiralty and Air Ministry, although the equipment is not expected to be in service for some time. A vibratory microphone is used to pick up the vibration caused by hits on the target, and the microphone current is used to trigger a radio transmitter which signals to the recording instrument. The equipment can be installed in ground, air or sea targets, and the recorder in a range-control hut or actually in the attacking aircraft.

It is thought that the new method will result in a great saving of manpower on armament ranges, and also in improved conditions for aircrew gunnery training. A pilot will be able to learn his errors while actually airborne, and apply correction in consequent attacks. The present hessian-covered wooden or metal frames used as ground targets are not a sufficiently firm base for the recording equipment, so that more solid, and realistic, targets will be provided.

W.J.A.C. Air Scholarships

GIRL candidates for the 1949 flying scholarships to be awarded by the Women's Junior Air Corps received trial flying lessons at the West London Aero Club, White Waltham Airfield, Maidenhead, on Sunday, May 15th, starting at 11 a.m. Nine scholarships are available, of which the Kemsley Flying Trust will finance two for every one raised by the W.J.A.C.s own efforts. The winners will be entitled to full tuition for a pilot's "A" licence. Test lessons for other competitors are also being held at Weston-super-Mare, Derby and Wirral.

Balloon Racing Again

THE Fédération Aeronautique Internationale is to revive the Gordon Bennett balloon races, which were last held in 1938. Take-off for the 27th competition will be at Brussels on September 11th.

Republic XF-91 Flies

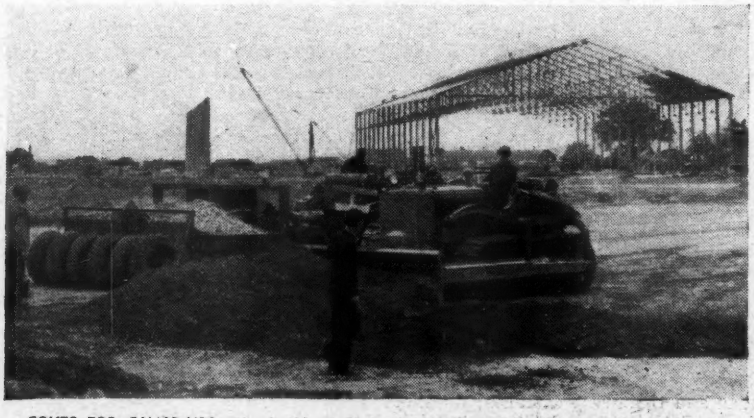
ONE of the U.S. Air Force's latest interceptor prototypes, the Republic XF-91, made its first flight at the Muroc Dry Lake test centre recently. Remarkable for its 30ft-span raked wing, with reverse taper, the XF-91 has also an unusual composite power-installation, consisting of one J-47 turbojet and four rocket units mounted in pairs above and below the tail-pipe. The rockets, however, were not fitted for the first flight.

Stratofreighter on the Lift

A BOEING C-97 Stratofreighter—military version of the Stratocruiser arrived at Rhein-Main airfield, Germany, on May 3rd, for service tests on the Berlin Air Lift. The aircraft carried a 20,000-lb load on its Atlantic crossing, including a complete Wasp Major power plant. Thirteen C-97s have now been delivered to the U.S.A.F., and the type is used by the Pacific Division of the Military Air Transport Service.

Round the Poles

IT is reported that Mr. Milton Reynolds, who flew round the world in 72 hours in 1947 in a converted Douglas Invader attack bomber (the *Reynolds Bombshell*), intends to finance a new globe-circling 25,000-mile flight via the North and South Poles. Although Mr. Reynolds does not intend to take part, it is believed that his pilot for the earlier flight, Capt. Bill Odom, will again be in charge. Capt. Odom's long-distance record flight in a Beechcraft Bonanza



COVER FOR CANADAIRS: In the No. 1 Maintenance Area of London Airport, hangars are already being built for the B.O.A.C. fleet of Canadair Fours, the first of which arrived recently. Two of the buildings are seen under construction, while a hard-standing for the aircraft is levelled in the foreground.

HERE AND THERE

from Honolulu to New Jersey, a distance of nearly 5,000 miles, was recently confirmed by the F.A.I.

Heligoland Appeal

THE Association of Heligolanders has appealed for the cessation of R.A.F. bombing practices on the island, which have continued since the end of the war. Representations were made to the Foreign Office and the U.N.O. Commission for Human Rights a year ago to have the island declared an independent principality.

Canadian Jet Controversy

ASKED if he was aware of the Canadian Government's decision to build the North American F-86 jet fighter under licence, the Under-Secretary of State for Air, Mr. de Freitas, replied that the British Liaison Staff in Ottawa had "never failed to bring the superiority of British fighters to the attention of the R.C.A.F." The type of aircraft to be used by them was, of course, a matter for the Canadian Government alone.

Airtech Tankers

BY slinging a 1,350-gall standard lorry tank beneath a British American Air Services Halifax, Airtech, Ltd., has succeeded in giving the aircraft a fuel-oil tankage of approximately 2,000 gallons. Three 250-gall internal tanks are interconnected to the main tank, and pressure refuelling, through two 2½-in drain cocks, takes only 14 min. Other charter Halifaxes on the Air Lift have been similarly adapted.

The photograph below shows another Airtech "mod." Fitted to four winches in the Lancaster's bomb-bay, the 32ft × 6ft pannier has a capacity of 10,000 cu ft and can carry a load of 10,000 lb.

Research in Scotland

A NEW mechanical engineering research laboratory is to be built by the Department of Scientific and Industrial Research at East Kilbride, near Glasgow. As an interim measure, temporary accommodation has been provided at Thorntonhall, a few miles from East Kilbride, and work is due to start there in the next few months on lubrication and machining research.

Among the permanent buildings of the establishment will be a hydraulic machinery laboratory with a water-flow capacity of 50 cu ft/sec. Closely allied with fluid flow is the subject of heat transfer, for the investigation of which a separate building is to be erected. Other research at the new laboratory will cover mechanics of solids (stress and vibration), mechanisms and engineering metrology, mechanics of formations (e.g., deep pressings) and machining processes.

TO-MORROW'S PASSENGERS: Proof of public interest in aviation has been given by the large crowds which visit M.C.A. enclosures at civil airfields throughout the country. This queue at Northolt is waiting to inspect the interior of a B.E.A. Viking.

Indian Prentice Airborne

THE first Percival Prentice to be built under licence by Hindustan Aircraft, Ltd., at Bangalore, Mysore, India, made its initial flight on April 30th. Capt. Munshi, Hindustan's test pilot, who flew the aircraft, expressed satisfaction.

D.H. Hollow-steel Airscrews

NEW forms of blade-construction being developed in conjunction with the increasing size of airscrews were referred to by Mr. W. E. Nixon, chairman of de Havilland Propellers, Ltd., in his address at the second annual general meeting of the Company. "We have been actively pressing forward," he said, "with our preparations for the manufacture of blades of a hollow steel form, involving a specialized and critical technique and expensive machine tools."

He also said that the occasion of the meeting might be taken to confirm the appointment [foreshadowed in *Flight* of September 2nd, 1948] of Air Marshal Sir Ralph Sorley, K.C.B., O.B.E., D.S.O., D.F.C., as chief executive of the company. Sir Ralph's distinguished Service career, largely on the engineering side, was particularly appropriate to the responsibilities he had now assumed.

News in Brief

PLANET AIRCRAFT, LTD., announces that G/C. F. H. L. Searl, O.B.E., has resigned from the board of directors and the office of managing director, with effect from March 9th.

* * *

The casket which contained Mr. H. O. Short's certificate of admission as an Honorary Freeman of the City of Rochester was the work of the Goldsmiths and Silversmiths Co., Ltd.

* * *

The technical staff of Power Jets (Research and Development), Ltd., has recently been strengthened by the addition of Mr. C. G. Conway, whose work with the Mond Nickel Co. on the development of high-temperature materials, and particularly on the Nimonic alloys, is well known.

* * *

Mr. Leslie Gamage, vice-chairman and joint managing director of the General Electric Company, Ltd., has been elected president of the Institute of Export for the seventh year in succession. He has also become chairman of the overseas standards advisory committee of the British Standards Institute.

* * *

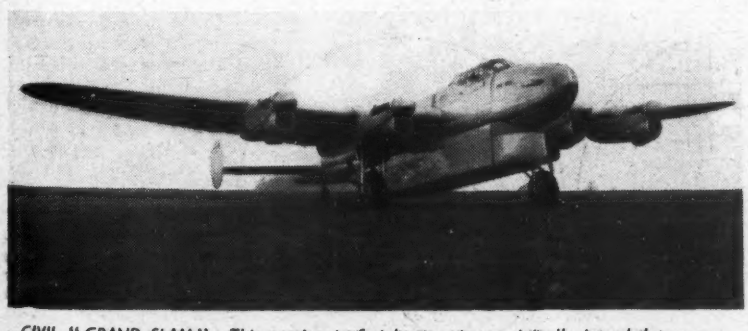
Mr. R. R. Parker has been appointed sales manager of the aviation and motor manufacturers divisions of Tecalemit, Ltd., and Mr. B. E. Richmond, previously general manager of the company's Scottish works, succeeds him as manager of the industrial and marine division.

* * *

The deputy managing director of Westland Aircraft, Ltd., Mr. E. C. Wheeldon, has just returned from an extensive six-week tour of the aircraft, machine tool and engineering industries of America. The tour included a visit to the United Aircraft Corporation, under licence from whom Westlands build the S-51 helicopter.

* * *

Among the most outstanding examples of publicity literature produced in French for the Paris Show were brochures by Armstrong Siddeley for the Mamba and Double Mamba; they included large reproductions of *Flight* sectional drawings by Max Millar and R. E. Poulton. In addition, a complete French-language reprint of the description of the Double Mamba was prepared by *Flight*.

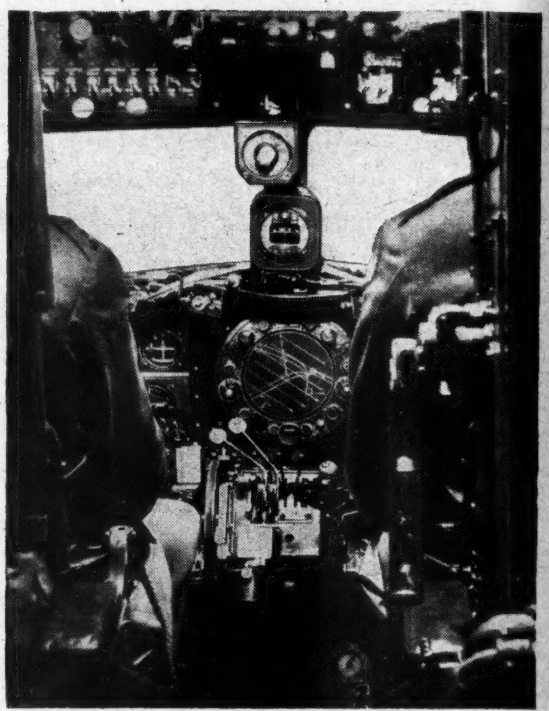


CIVIL "GRAND SLAM": This outsize in freight panniers, originally intended to carry two complete Tudor power plants, was fitted to a B.S.A.A. Lancastrian by Airtech, Ltd. Further details of Airtech's activities with bomber conversions are related on this page.

TELEVIEWED TRAFFIC-CONTROL

American Television-Radar System Giving the Pilot Pictorial Situation Display

IN much the same way that the fog-bound motorist wistfully dreams of some "magic eye" device capable of sundering the murk and allowing him to proceed unchecked, so many an airline pilot approaching his destination in low visibility has wished that a clearly defined picture might be presented to him of the approach zone and the *status quo*. Now, it would appear, the dream is within measurable distance of becoming a reality: the pilot's burden may be eased by giving him a visual picture of his own and other aircraft in the vicinity of his destination airport, together with approach paths, heading and wind vector.



Mounted in the centre of the instrument panel, the 7-in diameter Teleran screen is clearly visible to each pilot.

Thorough studies of some of the broader aspects of traffic control were made at the end of the war by several organizations in the United States, among them the Air Transport Association, the Airborne Instruments Laboratory, the C.A.A. and the Radio Corporation of America.

TECHNICALLY, the blind-navigation system described here is revolutionary: during its development it has aroused the greatest interest in America, but its reception in official quarters here is understood to have been somewhat less enthusiastic; European traffic-densities, of course, are not yet quite comparable with those of America. The description is digested from a paper by the inventor.

The results of these studies and the various systems developed provided part of the background for the deliberations of what was known as Committee SC-31 of the Radio Technical Commission for Aeronautics. During 1948, the U.S. Secretary of Commerce and Secretary of Defense established the Air Navigation Development Board for the purpose of planning and sponsoring the development of a common national system of air navigation and traffic control. The Board is permanent and is using the report issued by the SC-31 Committee as its guide.

One of the recommendations made by the Committee was that there should be ground radar equipment obtaining its responses from altitude-coded airborne responders. This equipment should be the chief source of data for traffic control and should produce a "pictorial situation display" for use on the ground and for transmission to each aircraft. It was specified that this display should be developed for all types of aircraft that fly on instruments and should be used in all phases of traffic control, i.e., initial approach, final approach and movement on the airport itself.

The provision of pictorial situation display to the extent specified in the SC-31 recommendations is given by a system known by the generic title "Teleran," originated by Mr. Loren F. Jones, of the Radio Corporation of America. Mr. Jones, pilot and engineer for 21 years, is a leading proponent of pictorial situation display, and in a paper published in the *Aeronautical Engineering Review* (February, 1949) he gives an exhaustive and admirably clear exposition of the subject. In the following notes we have abstracted from his paper those salient features of principal interest in the Teleran system.

By providing the pilot with a television-like picture, some serious aspects of the aircraft instrumentation problem are resolved. There is no reason to regard the process of interpreting instruments, scales, maps, aural ranges, verbal instructions and signals as being natural to a human being, but there is good reason to give man information in the form in which he has easily and conveniently acquired it for thousands of years—by vision of the pictorial type. The pilot thinks of his aircraft as a spot moving on a map. Uniquely, the television-like pictorial display does just that: it shows the pilot a special map of the area, the location of all aircraft at or near his altitude, where each is headed and which is his own, together with diagrammatic traffic control instructions.

To form a pictorial display by Teleran, all information necessary for general navigation, traffic control, collision prevention, landing and taxying control is obtained on the ground and automatically combined into a pictorial display. Altitude segregation is used so that the pictures presented to ground and airborne personnel concern single altitude-layers and are in a form well

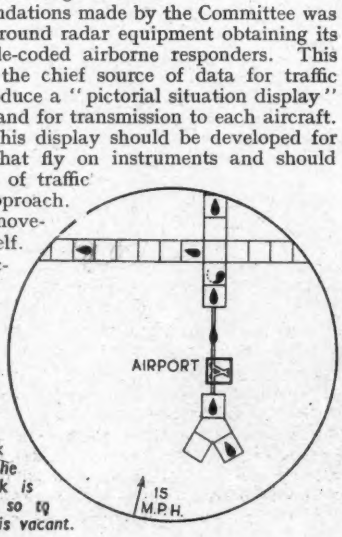


Fig. 1. Typical fixed-block display. The aircraft in the penultimate approach-block is circling and will continue so to do until the block ahead is vacant.

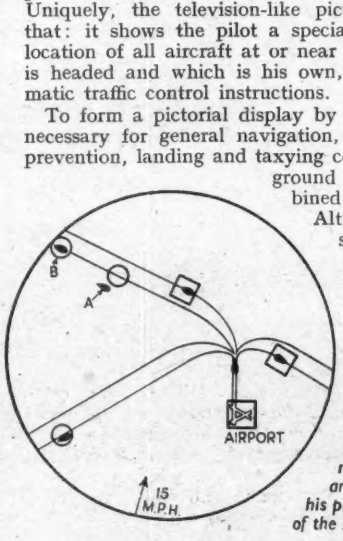


Fig. 2. Typical moving-block display. Circles are for fast aircraft, squares for slow aircraft. Pilot A needs to correct his position and Pilot B is in position at his predicted time at the boundary of the zone.

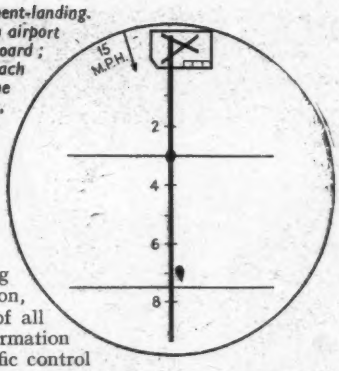


Fig. 3. Display for instrument-landing. Aircraft at seven miles from airport is slightly high and to starboard; pilot can see that the approach path is free except for the aircraft at three miles, which is shown to be exactly on the glide-path.

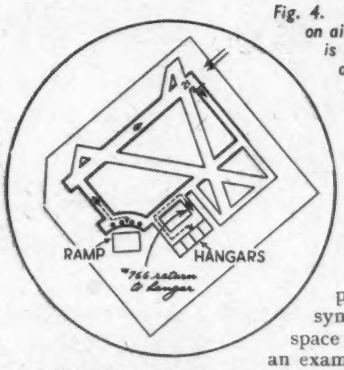


Fig. 4. Typical display for movement on airport. Note that one aircraft is held by bar at downwind end of runway and that instructions for another aircraft have been inserted by hand. They will be erased when the pilot has carried out the instructions.

adapted to interpretation and action. The composite picture for each layer is produced by combining ground radar information, showing the location of all aircraft with map information and diagrammatic traffic control displays and other visual data. New air routes are established by the simple expedient of adding new lines to the televised map. The complete television-like composite picture is projected on large screens on the ground and is then transmitted to each aircraft. Means are provided constantly to show each pilot which of the aircraft in the received picture is his own.

During final approach, the instrument-landing situation is presented pictorially to each pilot by means of data obtained from standard G.C.A. equipment. The received picture shows the position of the aircraft with respect to the ideal landing path and airport, and with respect to other aircraft on the landing path. Other pictorial data, such as weather maps, can readily be transmitted over the ground-to-air television link. The pictorial display unit in the aircraft produces a bright, flicker-free picture suitable for viewing in normal daylight. Although the present equipment weighs about 100 lb, further development should result in light, compact equipment suitable for installation in all aircraft down to and including the four-seater types.

Mr. Jones observes that the time will shortly arrive when human brains and posting boards will no longer be able

Televiewed Traffic-Control . . . . .

to cope continuously and reliably with the traffic situation. He states that within about five years congested areas such as that of New York may well have about a hundred aircraft simultaneously subject to traffic control during some hours of the day. At times of peak traffic, each runway in use will have to accommodate an aircraft about every 90 seconds, and, therefore, any aircraft as much as 40 seconds out of place will upset the traffic control situation.

There is general agreement that a computer must be available which, when any one aircraft arrives at the periphery of the control zone, will take into account the aircraft's speed capabilities, its altitude, its approach path, the wind velocities and the availability periods for the runway, so that appropriate instructions or control can automatically be transmitted to each aircraft. These must enable each aircraft to reach the beginning of the final approach with correct spacing from aircraft ahead and behind.

There are two basic concepts of traffic control: one based on the use of "fixed blocks" and the other on the use of "moving blocks." In the case of fixed blocks, each block consists of a fixed segment of the airway. As the pilot progresses from block to block, he does not enter the block ahead unless a green light (a private-line signal) and his pictorial situation display show that the block is vacant. If an aircraft is in it, he circles in his current block until the block ahead is free. Whilst he is circling within his block, the pictorial display shows him his position within the margins of the block and provides true safety from collision with other aircraft in adjacent blocks.

However, whereas blocks at fixed locations are appropriate for railway use, in that trains can stop, there are in the case of aircraft some advantages in the use of blocks that constantly move at variable speed along curved paths across the pictorial display, each symbol representing an air space for a single aircraft. As an example, the pilot of an aircraft could contact the traffic control centre when about five miles outside the traffic control zone, and state that he would be within the zone within two minutes, saying at the same time that he was approaching from a given direction and was flying a certain type of aircraft. In exactly two minutes, the automatic computer causes a block (B) to appear in the picture (Fig. 2), and the pilot finds himself within the block. The computer then moves the block toward the start of the final approach, automatically adjusting the speed of the block (within the safe speed limits of the aircraft) so that the block finally arrives at the start of the final approach with safe spacing from other blocks.

The Teleran link between ground and aircraft is uncritical of the amount of pictorial information carried by it. Thus, without modifying or rendering obsolete the ground and airborne equipment constituting the picture link, traffic control procedures can be changed from year to year in order better to adapt them to the ever-changing traffic requirements.

Mr. Jones observes that, no matter whether the pilot is flying a military, private or commercial aircraft, scheduled or non-scheduled, under fixed-block or moving-block traffic control, when he reaches the start of the final approach (glide-path), he enters the second phase of traffic control—that is, he utilizes his instrument landing system.

The SC-31 recommendations provide I.L.S. and G.C.A. and pictorial situation display for final descent. Since the pictorial display gives the pilot all the information that he gets from the standard I.L.S. system as well as G.C.A. information to allow him *to talk himself down rather than be talked down by a ground controller*, it seems probable that, eventually, pilots will use the picture as the primary means of accomplishing the final approach with any other means reserved for use as a check and in emergencies. An important point is that it will be the pictorial situation display that will show the pilot the location of other aircraft ahead of and behind him on the final approach.

In Fig. 3 is shown a typical picture seen by a pilot when he first switches on his landing display at the start of the final approach. As before, he sees himself as a spot moving on a map. He immediately sees whether he is to the right or left with respect to the approach path as well as his distance from the airport. He sees an actual map of the airport and has visual information regarding wind. A horizontal line produced automatically within the Teleran equipment represents the elevation of the glide-path with respect to his aircraft. In the case illustrated, the pilot seven miles from the airport finds himself slightly to the right of and above the glide-path. The aircraft three miles from the airport is exactly in position. As an aircraft proceeds toward the airport, so does the horizontal line, with the aircraft's distance above or below that line indicating distance above or below the glide-path. This indication becomes more sensitive as the airport is approached. To resolve any ambiguity as to which indication refers to his aircraft, the pilot need merely press a button to interrupt the operation of his transponder, whereupon his spot fades momentarily from the picture.

TRIBUTE FROM THE TURTLE

Record-Breaking Lockheed Neptune Here to Commemorate First Atlantic Flight

"Flight" photographs.

With Cdr. Davies at the controls, the P2V, "The Turtle", in which the Commander secured the world's long-distance record for America, is seen above arriving at Northolt. Below, left to right, are Vice-Admiral Sir Reginald Portal, Rear-Admiral A. C. Read and Cdr. Davies.

THIRTY years ago—on May 8th, 1919—a Curtiss NC-4 flying boat of the U.S. Navy, piloted by Lt.-Cdr. Albert Cushing Read, laboured into the air from Rockaway, New York, its outrigged tail giving an impression of spidery frailty despite the exceptional size of the machine (the span was 125ft). This impression the NC-4 was to belie by completing the first Atlantic air crossing in history. True, the flight was a protracted one and beset by all manner of difficulties and delays; but after the elapse of 23 days Lt.-Cdr. Read set the big boat down at Plymouth. Two other NC boats which had left America at the same time failed to reach the Azores.

The NC-4's crossing involved stops at Chatham, Massachusetts; Trepassey Bay, Newfoundland; Florez Horta and Ponta Delgada, Azores; and Lisbon. The actual transatlantic passage to Lisbon took 19 days, that is, until May 27th. *En route* from Lisbon to Plymouth repair stops were made on the Mondego River, Portugal, and at Ferrol in Spain.

To-day the stalwart NC-4, or at least its hull, is to be seen in the National Air Museum of the Smithsonian Institute at Washington. The wings are in store because of insufficient accommodation, and complete assembly must await the building of America's National Air Museum.

Last Wednesday week (May 11th), as a Rear-Admiral, U.S.N. (ret.), the pilot of that same NC-4 saw Plymouth again—this time from the P2V Neptune, *The Turtle*, holder of the world's long-distance record of 11,236 miles. As a passenger in this famous Lockheed of the U.S. Navy he had left New York on Sunday, May 8th, making his official departure from a point overlooking the spot where the NC-4 had taken off exactly 30 years before. Accompanying him was his old mechanic on the 1919 flight—Aviation Chief Machinist Mate Eugene S. Rhoads—and piloting *The Turtle* was its record-holding pilot, Cdr. Thomas D. Davies, U.S.N. The co-pilot was Lt. Cdr. W. Y. Morton, U.S.N., and the navigator Lt. (Junior Grade) John E. Echterling, U.S.N. There were five other crew members.

The Turtle's first stop was at Lisbon, where appropriate courtesies were paid, and on the morning of May 11th she left for Plymouth. Her arrival over the city, shortly after 1400 hours, was signalled by siren-blasts from harboured vessels and by the uplifting of crowded faces on the Hoe. By radio telephone from the U.S.S. *Mercury*, lying in the Sound, the Lord Mayor, Alderman H. J. Perry, exchanged greetings with Rear-Admiral Read, who recalled the cordial reception accorded the crew of the NC-4 and observed "We cannot foresee the future, but we do know that we shall be standing shoulder to shoulder in the cause of peace."

Having paid her respects to Plymouth, the *Turtle* flew on to Northholt where, among others waiting to greet Rear Admiral Read, were Vice-Admiral Sir Reginald Portal, R.N., Flag Officer Air (Home); Rear-Admiral George R. Henderson, U.S.N., Deputy C.-in-C., U.S. Naval Forces, Eastern Atlantic and Mediterranean; Commodore Tully Shelley, U.S.N., U.S. Naval Attaché and Attaché for Air, London; and Rear-Admiral D. S. Cornwell, U.S.N., who relieved Commodore Shelley on May 18th.

Rear-Admiral Read told *Flight* that he is now a landplane convert, though for many years he staunchly advocated the flying boat.

Commander Davies told us something of the development of the P2V, with which he has been most intimately concerned since 1944. The exceptional qualities of this aircraft as a long-range anti-submarine weapon are already appreciated in this country. That a P2V, with a span only 2ft less than a Lancaster's, has more than once been slow-rolled on one engine is, we believe, less generally known.

At the Orly display, as recorded elsewhere in this issue, *The Turtle* demonstrated J.A.T.O. take-off.

"Flight" photograph.

A flash-back to Hendon, thirty years ago. Lt.-Cdr. Read, as the Admiral then was, greeting Harry Hawker, whose transatlantic attempt ended in glorious failure.

NC-4 AND P2V. A COMPARISON

	NC-4	P2V
Engines ...	4 Liberty (1,600 h.p. total)	2 Wright Cyclone 18 (4,600 h.p. total)
Span	125ft	100ft
Chord... ...	12ft	10ft
Gross wing area	2,380 sq ft	1,000 sq ft
Length... ...	68ft 3in	75ft
Gross weight ...	28,000 lb	58,000 lb
Cruising speed	80 kt	200 kt
Crew	6	8

The second prototype, which recently completed C. of A. tests at 18,000 lb all-up weight.

Marathons on the Way

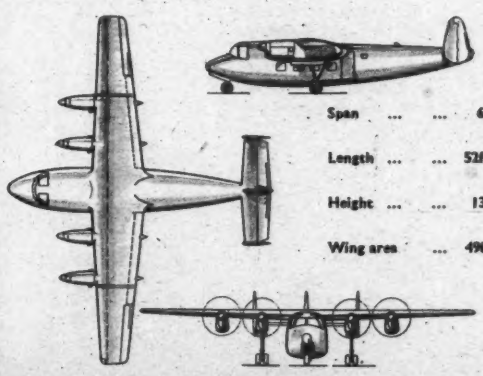
Development and Production Regain Impetus at Handley Page (Reading) Ltd. : Mamba-Marathon 2 Progresses

INEVITABLY there has been a serious interruption in the original development and production programme of the Marathon. A large integrated organization with 5,000 employees quite suddenly ceased operation and the factory was left in the hands of a staff of about 200. After some weeks one product, the Marathon, was singled out and the task of replanning a portion of the Miles factory for efficient and economical production was tackled by the new company, Handley Page (Reading), Ltd. A very creditable job has been done in a few months; employee-strength has been built up again to about 2,000 and there are encouraging indications of production in the form of an assembly line headed by No. 1 production Marathon, already on its wheels and with engines installed. It is expected to fly at the end of June.

The work of rearranging and re-equipping that portion of the original factory which has been taken over for aircraft production continues. The remainder, devoted to other former Miles products, is now operated by Western Engineering, Ltd. The Technical School has been taken over by the local educational authorities and, regrettably, aerodynamics are no longer included in the syllabus. The V.R. training centre operates at Woodley under the control of Handley Page (Reading), Ltd., which is served by the same board of directors as the main company, and their's are the decisions as to policy.

MARATHON I DATA
(Four 345 h.p. Geared and Supercharged D.H. Gipsy Queens)

Max. take-off and landing weight	18,000 lb
Wing loading	36.14 lb/sq ft
Power loading	13.31 lb/h.p.
Max. fuel capacity	280 gall
Rate of climb, 18,000 lb, S.L.	683ft/min
Rate of climb, 18,000 lb, S.L. 3 eng.	240ft/min
Time to 10,000ft	14 min
Service ceiling	18,400ft
Max. level speed (6,750ft, 17,100 lb)	232.5 m.p.h.
Max. w.m. speed at 10,000ft	209 m.p.h.
Best range speed at 10,000ft	157.5 m.p.h.
Take-off at 18,000 lb I.C.A.N. S.L.	461 yd
Take-off at 18,000 lb I.C.A.N. S.L. to clear 50ft	841 yd
Take-off speed (18,000 lb)	82.5 m.p.h.
Landing speed (14,000 lb)	68.7 m.p.h.



A production schedule for Marathons has now been worked out. The first production aircraft is to fly late in June and the second three months later. Four will have flown by the end of the year and the rest of the first order for forty should be completed at two per month, increasing to four. This schedule is, of course, dependent, among other things, upon the delivery of engines and airscrews.

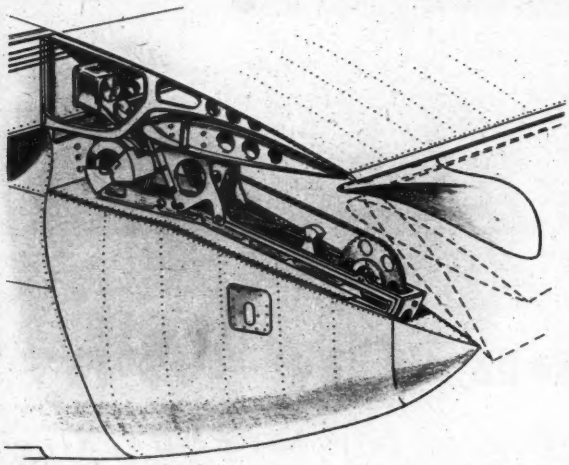
There are, in addition, one prototype (which has recently completed C. of A. tests at the increased all-up weight of 18,000 lb) and the Mamba-Marathon 2, which is coming on well and will, it is hoped, have done enough flying to make an appearance at Farnborough in September. Of this more will be said later.

A word about the performance, present position and

Marathons on the Way . . . . .

WEIGHT ANALYSIS

Structure weight	5,353 lb
Power units	4,292 lb
Fuel system	200 lb
Power services	662 lb
Sundries	222 lb
	10,729 lb
Radio, furnishings, heating, precautions, instruments, etc.	1,156 lb
	11,885 lb
Crew and baggage	535 lb
Basic equipped weight	12,420 lb
Passengers and baggage	4,126 lb
Fuel (167 gall, 500-mile range)	1,202 lb
Oil (28 gall)	252 lb
All-up weight	18,000 lb



(Above) The tail ends of the nacelles contain the flap-operating mechanism. As the flap moves rearwards and downwards the hinged beak-like cover opens up. The Mamba-Marathon carries small dummy nacelles in the outboard engine position to house this mechanism.

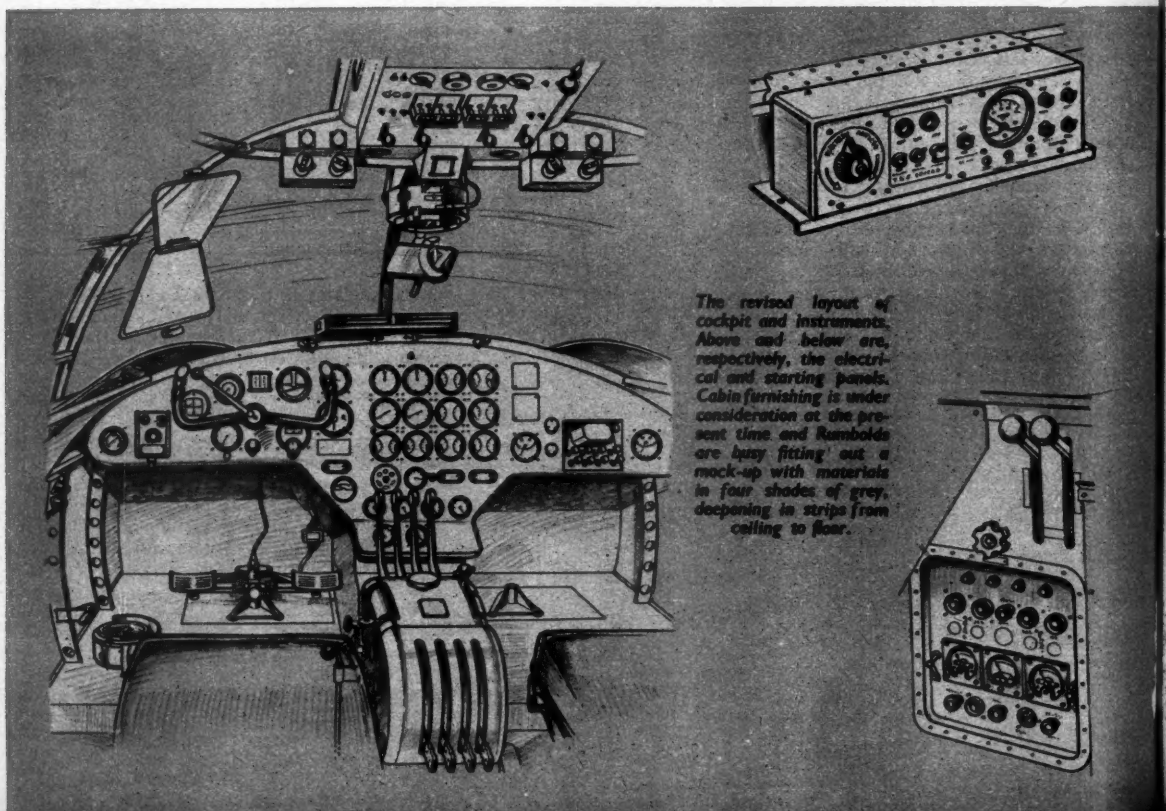
future of the Marathon 1 will be appropriate at this point. The aircraft was designed for short- and medium-range passenger transport, and by virtue of its clean exterior the cruising speed is high. Up to 22 passengers and their luggage can be carried, but a 20-seat version will probably be the standard arrangement. The advantages of a four-engine layout for passenger work are well known, and the ability of the Marathon to exceed the proposed 1952 I.C.A.O. safety requirements may become increasingly important. The engine power available (4 × 345 h.p. for take off and 4 × 275 h.p. for economical cruising) is modest but adequate, and the most economical speed of operation at 10,000ft is no less than 200 m.p.h. At 5,000ft it is only 10 m.p.h. slower. Economical stage-lengths are between 150 and 400 miles. Maximum landing weight is the same as maximum take-off weight, so the Marathon may be operated fully loaded on any trip. As a freighter the Marathon can carry a payload of 4,000 lb for 500 miles.

From the manufacturers' point of view the order for 40 Marathons is satisfactory for a start, but additional orders are being sought all over the world. The Marathon is of all-metal construction and should be suitable for operation anywhere in the world. Moreover, it is virtually in a class of its own, its only direct competitor being the Beechcraft Model 34, known as the Twin-Quad, which is a fraction larger, and has four 375 h.p. Lycomings and a rather higher range and rate of climb. The economical cruising speed, however, is somewhat lower.

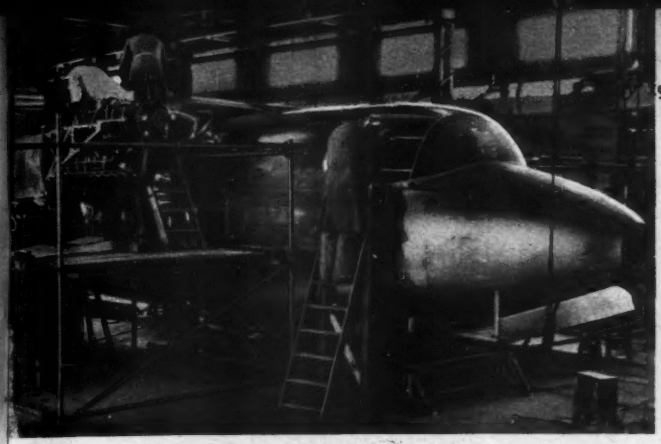
Many months ago one of the criticisms levelled at the Marathon was on the score of its short range. The additional fuel capacity of 60 gallons (4 × 15 extensions) which is now provided will make a substantial improvement in this respect and, moreover, the increase in all-up weight from 16,500 to 18,000 lb will greatly improve the economics.

The aircraft is intended for operation by a crew of two but provision is made for the carriage of a third member. The crew compartment is unusually spacious and the view forward exceptionally good. The pilot, in high seat-position, can, in fact, see the ground 12ft in front of the aircraft, and his range of vision round the horizon is 210 degrees.

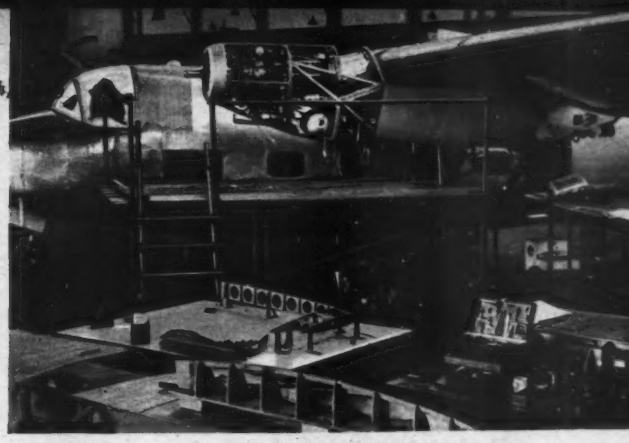
Most of the aircraft services are pneumatically operated. These include the nose-wheel undercarriage, flaps, brakes, priming pumps and engine air-intake shutters. The air



The revised layout of cockpit and instruments. Above and below are, respectively, the electrical and starting panels. Cabin furnishing is under consideration at the present time and Rumbolds are busy fitting out a mock-up with materials in four shades of grey, deepening in strips from ceiling to floor.



Photographed early in May, the first production Marathon is making good progress. The four engines are now installed.



The two Mamba turboprops are now mounted in the Marathon 2. The jet pipes pass over the wings. Note the small dummy outboard nacelle.

system incorporates anti-freezers to eliminate the risk of failure at high altitude.

From the passenger's point of view the roomy cabin of the Marathon will be an appealing feature. The large, clear space available, coupled with a level floor near the ground and a large door, will also be most convenient for freight work. The average height of the cabin is 6ft 3in, the length is 18ft, and the volume 760 cu ft. Various seating plans for from 14 to 22 passengers have been worked out. The cabin is sound-proofed and air-conditioned, and the nine large rectangular windows, in conjunction with the high-wing layout, will give an excellent view of the countryside.

At the rear of the cabin there can be a toilet compartment, a luggage hold and a wardrobe, while between the front seats and the cockpit there is another small compartment for radio and such things as diplomatic mail. Its capacity is 104 cu ft. A Daniels heater together with its fuel tank are located at the aft end of the fuselage, and heat for the cabin and cockpit is led forward in two ducts beneath the floor. This heater is also used to warm the cockpit and to de-mist the windscreen.

Recent Modifications

Close examination of the latest Marathon reveals a number of modifications, while certain differences are immediately apparent. The third centrally placed fin fitted to the first prototype, but omitted on the second, has been finally adopted. The small but unsightly external mass-balances for the control surfaces have also been removed. Another visible alteration to the empennage is the slight modification to the shape of the rudder horn balance. The forward point is no longer part of the rudder.

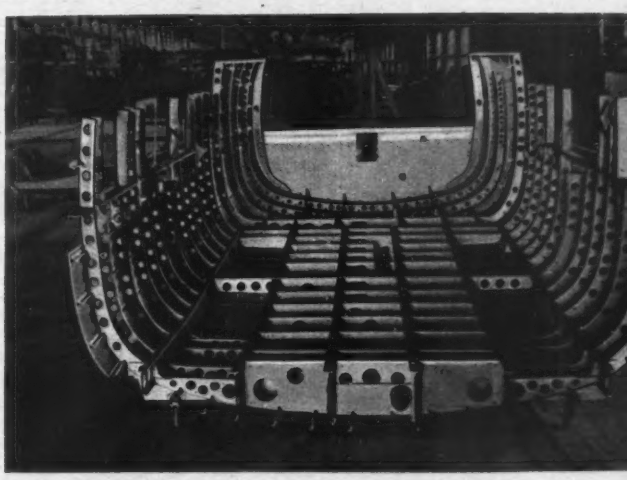
The elevator has been altered, although the change is barely visible. In fact, the hinge point is 1in farther aft and a 1in extension has been made to the elevator nose. This is a simpler modification than it may sound, the hinge bracket having been mounted on a 1in distance-block on the tailplane spar instead of on the rear face of the spar.

Detail changes farther forward include the deletion of the small freight door which was originally positioned close to the first pilot's seat, and a modification to the air-intake scoops for the Gipsy Queen 70 engines. All the foregoing modifications are shown in the new cut-away drawing overleaf.

From the production point of view there has been a number of changes, and in several respects procedure now follows Handley Page practice more closely. The fuselage, for example, is divided horizontally as well as into front and rear sections. The four units are more accessible and more work can be done on them at the earlier stages. The four main frame members of the fuselage have been stiffened by the addition of straps on sides, top and bottom, following restressing of the structure for 18,000 lb a.u.w.

The nose section is built in one piece on the original Miles-type spider jig.

The spar booms for the mainplanes are milled at Cricklewood and the spar is assembled at Woodley. The Marathon was first described in detail in *Flight* of September 4th, 1947, and it may be recalled that the wing has one main spar and a subsidiary spar at 70 per cent chord. The nose section of the wing is now attached to the spar to form a D-box at an early stage instead of waiting until the spar is in the main wing-jig, when it would be a much less convenient operation.



The main fuselage units are now split horizontally for production. A pair of hot-air ducts is located under the floor.

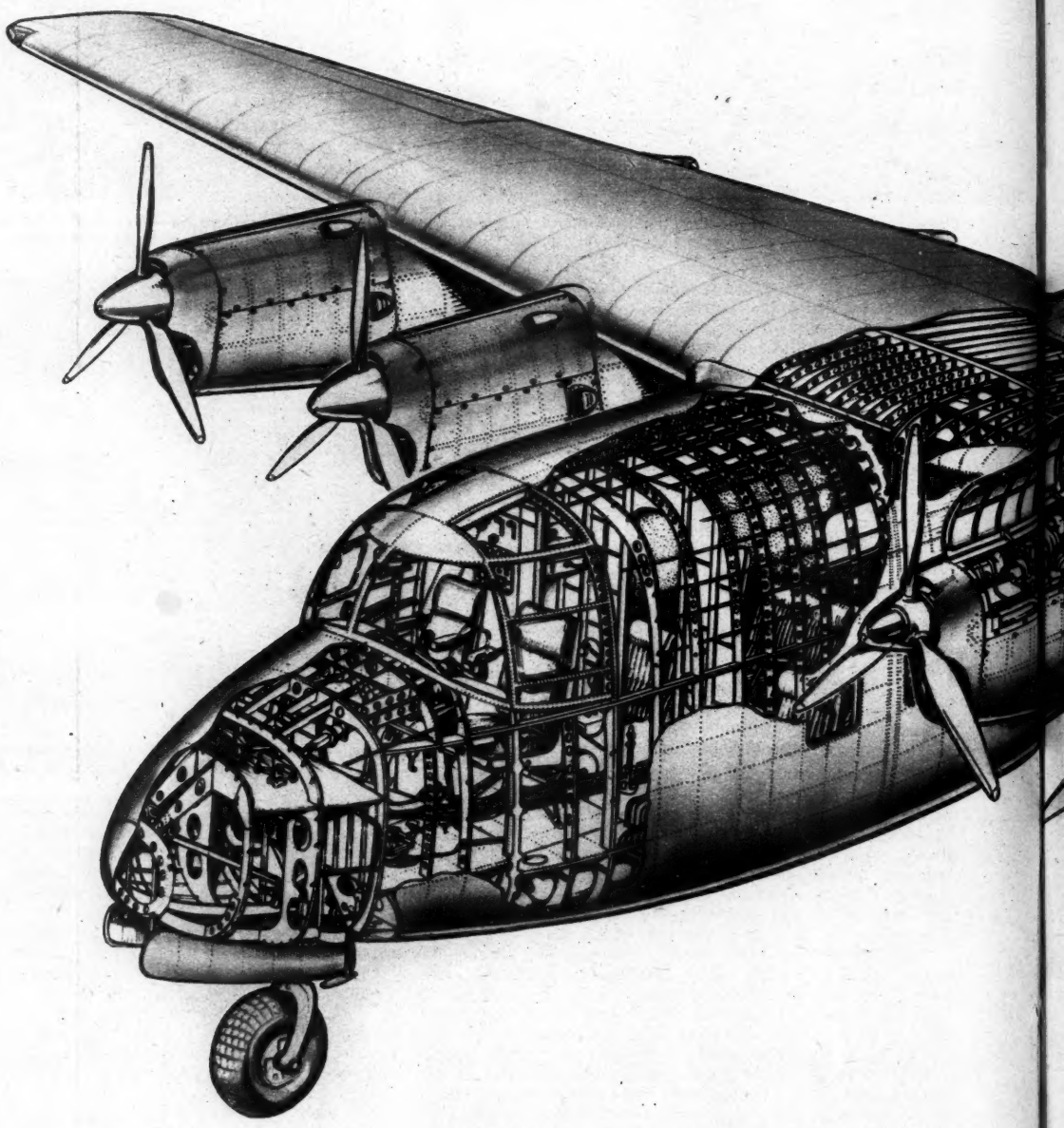
Extensive use of thin skin on the Marathon—only 26 s.w.g.—adds to the problems of production.

Provision for de-icing has occasioned a great deal of thought, and the opinion is held that thermal de-icing will be the only satisfactory solution. Accordingly, a thermal system is being developed and it is expected that it will be incorporated in No. 6 production machine. On the first five provision will be made for the attachment of Goodyear boots.

The incorporation of thermal de-icing will entail a major modification to the wing leading-edge, but not a rebuild. A detachable leading edge to the outer wings, tailplane and fins is envisaged. The first five Marathons will probably be delivered to West African Airways, and the thermal de-icing system for the subsequent B.E.A. machines should be ready for trial installation by next winter.

An important modification in production Marathons is the addition of four extra fuel tanks in the wings. They are, in effect, 15-gallon extensions of the existing four tanks, with which they are interconnected through the wing ribs. Outboard engines have their fuel tanks and extensions outboard, and the inboard engines have them inboard. The total capacity is now 280 gallons, and the tanks in the production machine are of the flexible, crash-proof type, by Fireproof Tanks, Ltd. Each engine has its separate fuel system and there is a cross-feed cock between the outer and inner tanks on each side.

Marathons on the Way . . . . .

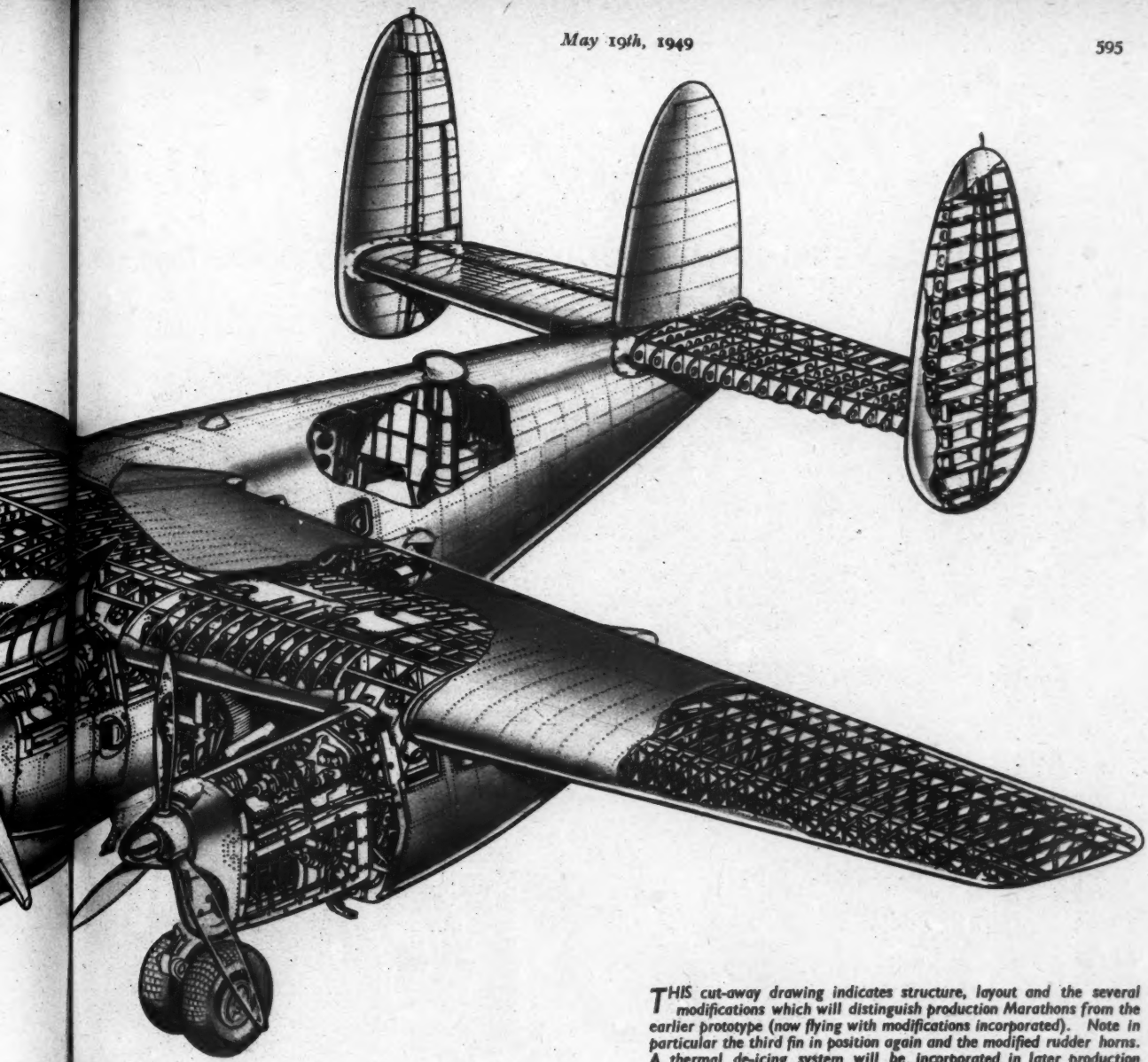


Returning to the subject of the Armstrong Siddeley Mamba-powered Marathon 2, progress on this experimental prototype has, after a period of inactivity, been good. The two Mamba turboprops replace the inboard Gipsy Queens, being mounted ahead of the wing leading edge. The engine nacelles deepen rearwards towards the main wheel-stowage compartments and the oil tanks are situated beneath the combustion chambers. The jet pipes are directed quite sharply upwards over the wing spar and then follow the wing upper surface to exhaust level with the tail of the nacelles.

On the Gipsy Queen-engined Marathon the rear ends of the four nacelles house the sizeable guide-rails and operating mechanism for the flaps (see illustration). In the case of the Marathon 2, small so-called dummy nacelles are fitted to fair off this flap gear. It has been suggested that as these dummy nacelles must be fitted, they might be enlarged to full drop-tank proportions in order to be able to carry more kerosene for the Mambas, wing space for the tanks being rather restricted.

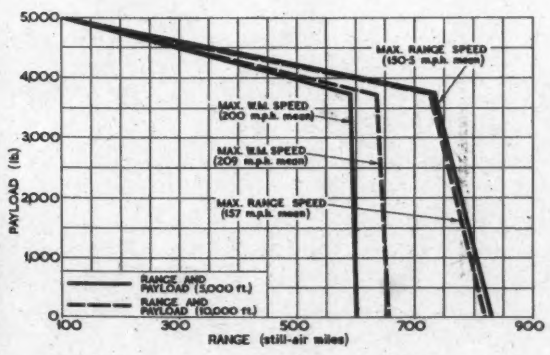
Among the various modifications necessary for installation of turboprops is the strengthening of the tailplane and fins. The jet pipes discharge over these surfaces but, as the efflux is very small, ill-effects are improbable.

Although the Marathon 2 appears well advanced, a great deal of detail equipment, including the engine controls, has to be looked after, and certain items are in short supply. The experimental section will have to work very hard to complete the aircraft in time for it to fly and appear at this year's S.B.A.C. display.

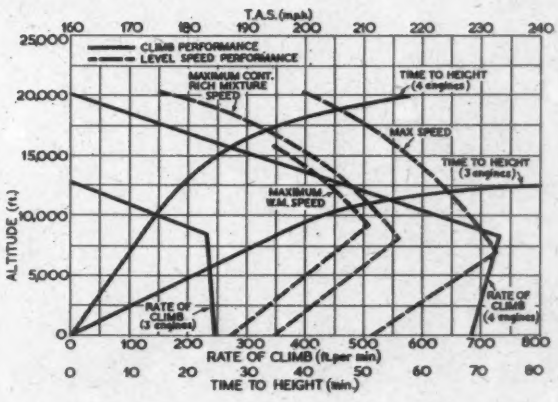


THIS cut-away drawing indicates structure, layout and the several modifications which will distinguish production Marathons from the earlier prototype (now flying with modifications incorporated). Note in particular the third fin in position again and the modified rudder horns. A thermal de-icing system will be incorporated in later production aircraft for British European Airways Corporation.

Range and payload curves for a 20-seater layout at 5,000 and 10,000ft. In the climbs and descents 90 and 189 miles are covered respectively.



Climb and level speed performance curves for the Marathon I. The respective weights involved are 18,000 lb (max. take-off) and 17,100 lb.



Assembly of Aeronauts

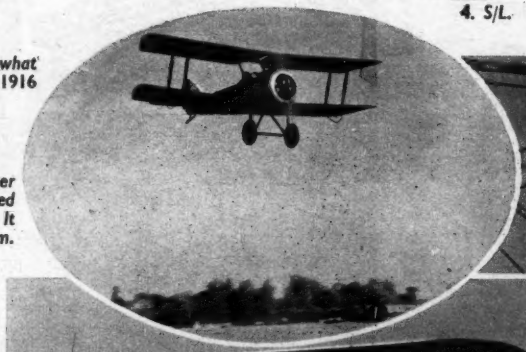
Or, the Garden Party of the Royal Aeronautical Society Further Depicted

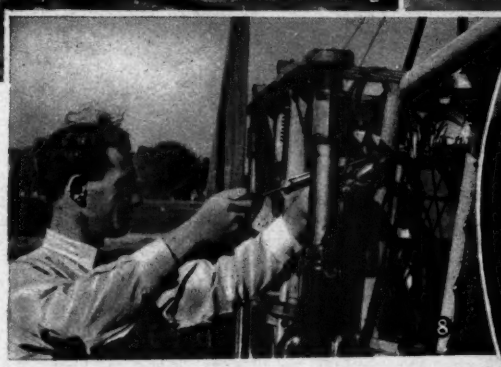
1. G/C. Wheeler showing what a good aircraft the 1916 Sopwith Pup still is.

2. The two-seater Hawker Cygnet of 1924, the total loaded weight of which was 730 lb. It was designed by Sydney Camm.

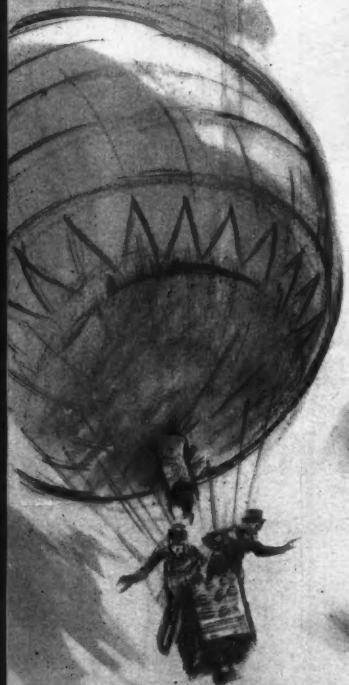
3. Jeffrey Quill, except for a cap with the peak at the back, looked quite the part in the Bleriot cockpit.

4. S/L. Wade performs on G-EBMR, the famous "civil" Hawker Hart, now 19 years old.



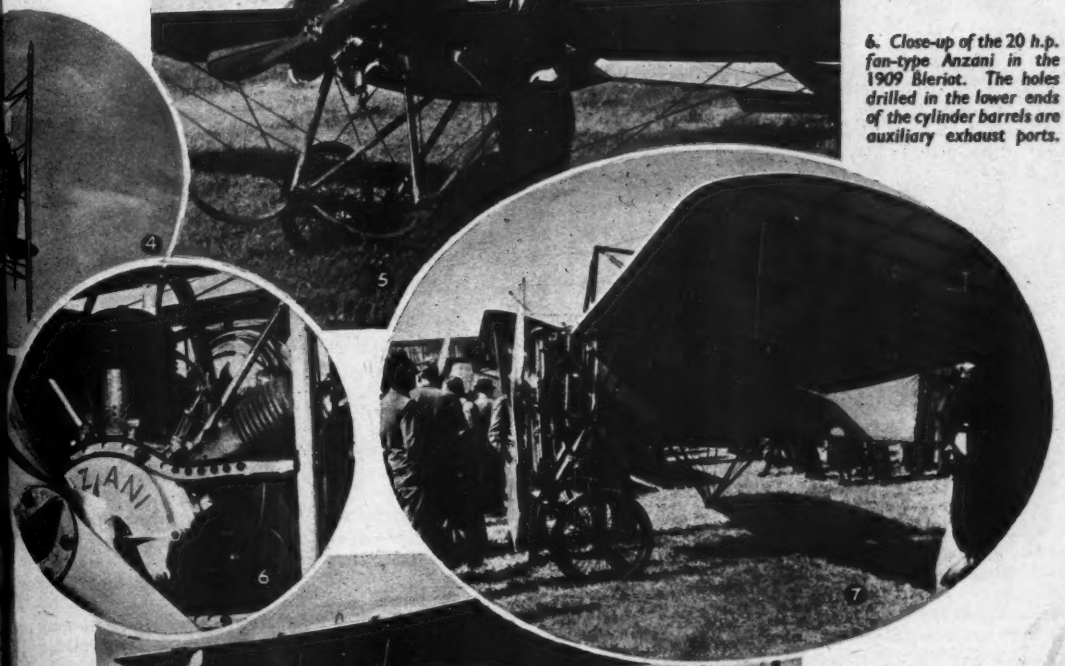


8. Starting assistance: Injecting spirit directly into the intake of the 20 h.p. Anzani.



5. W/C. Kent's modern goggles are the only signs that this photograph of the Deperdussin was not taken in 1912.

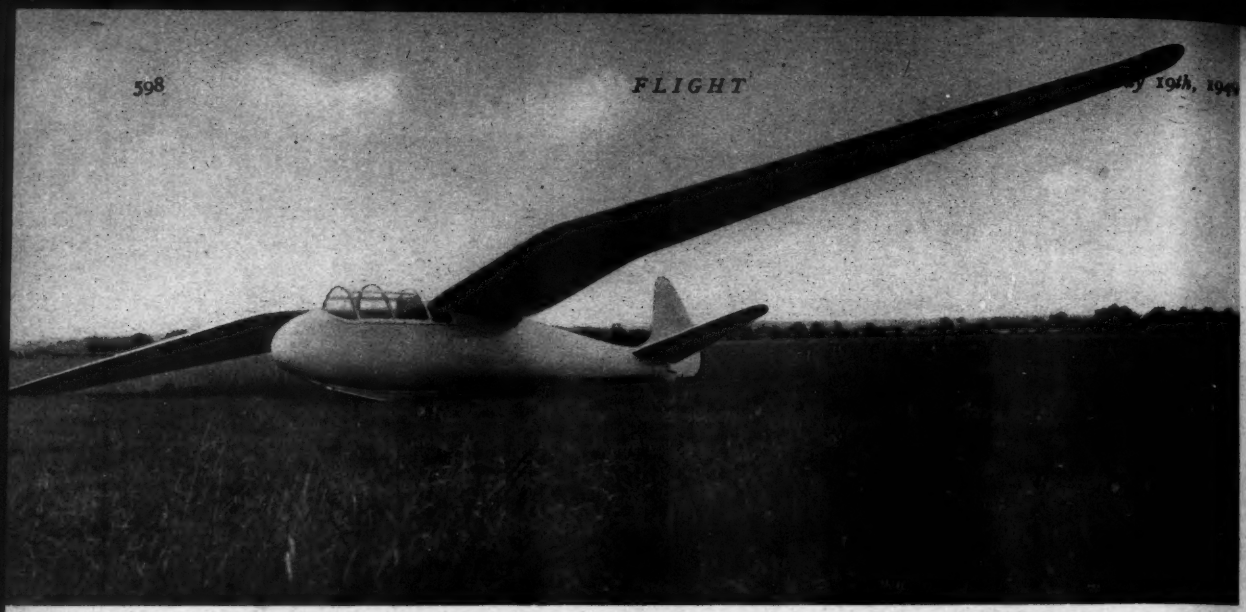
6. Close-up of the 20 h.p. fan-type Anzani in the 1909 Bleriot. The holes drilled in the lower ends of the cylinder barrels are auxiliary exhaust ports.



7. The historical aircraft provided the focal point for the guests' interest.

9. Dr. Roxbee Cox, president of the R.Ae.S., in the balloon basket.

10. Not a Firebrand: P. G. Lawrence in the side-by-side Blackburn Bluebird of 1932.



Fouga C.M.7 tandem two-seater.

Les Planeurs

Sailplane Developments in France

THAT France is well abreast of modern technique in glider design was evident from the few but thoroughly up-to-date designs on view at the Paris Salon. In conception, construction and finish these sailplanes left little to be desired.

In production for over two years, the Arsenal de l'Aeronautique Air-100 has been flown in America and Switzerland as well as in France. It has done well and secured records, including the women's duration record, recently raised to 35 hours by Mlle. Choisnet. Of high-mid-wing type, it is an orthodox but excellent high-performance aircraft of high inherent stability. The newer Air-100 differs in having no slot between ailerons and wings.

Completely new—it has completed its first series of test flights—is the Ars-4 111, a high-penetration type with a wing having a bi-convex section and an aspect ratio of 18. Structurally, it is of particular interest in having a duralumin main spar to which the wooden members are attached by the English Redux process. Thus an aspect ratio and wing-loading which greatly exceed those of the Air-100 is achieved with an ample factor of safety. Each aileron is slotted and in two portions, and trailing-edge flaps assist in giving a minimum sinking-speed of 0.58 m/sec. Gliding angle is 1 in 30, length is 26ft 2¼in, span 59ft 7in and all-up weight 741lb.

Another new type—test-flown before the Show by M. Lepanse, C.F.I., of the Beynes Thermal High-performance Gliding Centre—is the Breguet 900. It is a relatively small (43ft 7in span), fast and very manœuvrable high-performance aircraft. The tips of the thin, tapering wing (of Breguet L-14 section) are fitted with small anti-tip-stalling shields; there are slotted ailerons, and flaps which can be deflected downwards through 40 deg.

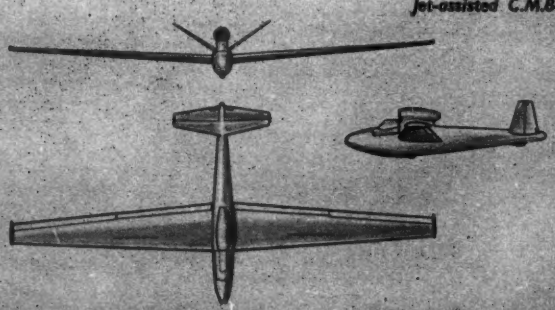
An interesting refinement on the second prototype—not shown at the Salon—is an arrangement whereby the tail surfaces fold up, instead of being detached, for de-rigging.

An attractive high-performance tandem two-seater by Castel Maboussin was exhibited in fuselage-only form by Fouga et Cie. The C.M.7 aircraft is of the high-gull-wing type and the double cockpit is roomy and comfortable; with a suitable hood it should lend itself admirably to blind-flying training, and should also be valuable for those meteorological research flights which require the assistance of an air observer. M. Nessler recently flew a C.M.7 over 200 miles from Beynes to Poitiers. All-up weight is 1,179 lb, gliding angle 1 in 27, sinking speed 0.75 m/sec and best gliding speed 43.5 m.p.h.

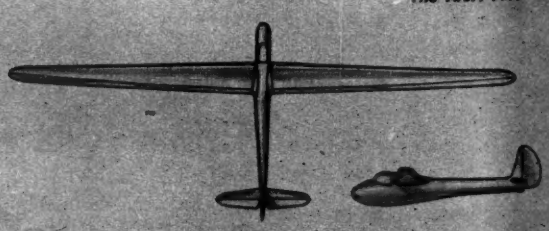
A second Fouga exhibit, the C.M.8-R 13, or Cyclone, was one of the novelties. It is a jet-powered glider and, although it has not yet flown, the antecedents of both the airframe and the power unit suggest that it should do so satisfactorily. Based on the C.M.8, a fast aerobatic sailplane of 42ft 6in span, the machine carries a Turbomeca Sydlowski turbojet above the centre-section. This little unit—it measures 31.5in×15.7in and weighs 99 lb—is expected to provide 220 lb of static thrust. To avoid the jet efflux, the conventional type of tail unit has been abandoned in favour of a 45-deg-dihedral tailplane in which the elevators perform the functions of both horizontal and vertical control-surfaces. With fuel (165 lb) and accessories the all-up weight of the machine amounts to 1,067 lb.

Expected speed at 10,500ft is at least 160 m.p.h., with a climb of 3.9 m/sec. The machine should leave the ground after a take-off run of 360yd; presumably some initial wing-tip assistance will be required, as a conventional single-wheel glider undercarriage and skid are fitted.

Jet-assisted C.M.8-R.13.



The Ars.4-111.



The Lord Mayor of London christening the B.O.A.C. Short Solent flying boat at Tower Pier. The ceremony is described below.

Solent in London: I.C.A.O. Discusses Joint Support of Facilities: U.S. Cargo Schedules: Where Brabazon May Land

CIVIL AVIATION NEWS

SOLENT'S CHRISTENING

WHAT may be taken as a hint of official determination to maintain Britain's unique position as a large-scale operator of civil flying boats was given by a Government speaker at a ceremony in London last week.

The occasion was the christening of one of the new B.O.A.C. Short Solents which, as reported in our May 12th issue, has been on public view on the Thames near Tower Pier. The ceremony took place on May 10th, when the aircraft was christened *City of London* by Sir George Aylwen, Lord Mayor of London and Admiral of the Port of London.

As the high tide neared its turn the flying boat was secured to the embankment steps by Traitors' Gate and the Lord Mayor poured South African champagne on to its bow from a George II silver chalice.

Sir George said that as Britain's history had begun on the waters of the Thames, so, he hoped, was a new phase of history being formed in which Britain would be as superlative in the air as she had been for so many centuries on the water.

The Lord Mayor was welcomed on arrival by Sir Miles Thomas (chairman-designate of B.O.A.C.), Mr. Whitney Straight (chief executive), Major R. H. Thornton and Mr. H. L. Newlands (members of the Board), Mr. J. W. S. Brancker (general manager, Eastern Division), Capt. H. W. C. Alger (manager of No. 4 Line, B.O.A.C.), and Capt. J. L. M. Davys, flight captain of No. 4 Line, Southern Region, B.O.A.C., and commander of R.M.A. *City of London*.

Mrs. Oswald Short talking to the Lord Mayor, Sir George Aylwen, after naming the flying boat. On the extreme left are Sir Miles Thomas and Mr. Oswald Short and on the right are Mr. John Brancker and Mr. Whitney Straight.

In thanking the Lord Mayor, Mr. G. S. Lindgren, M.P., Parliamentary Secretary to the Ministry of Civil Aviation, referred to the future of the flying boats and the fact that B.O.A.C. were ostensibly the only major airline operating them. This state of affairs was due, he said, to the great development of the landplane and of international airports during the war. The cost of marine bases consequently fell upon the lone flying-boat operator ; the circumstances were not comparable with those of landplane operations, in which facilities were provided in return for modest landing fees. Although this burden had rendered flying-boat operations at a disadvantage economically, Britain had retained her faith in this type of aircraft because of its superior standards of comfort and security. Whether in the end we should be able to re-establish the popularity of the flying boat or whether the inexorable forces of airline economics would oblige us to abandon it remained to be seen. He expressed the hope that, through our perseverance, other operators would be encouraged to use flying boats.

IMPORTANT I.C.A.O. DISCUSSIONS

THREE projects of importance, all involving schemes of joint support by member-states of I.C.A.O., have come up for consideration at the same time and have been discussed in London. The inability of many countries to meet in full the requirements of ground organization for international air transport has caused the operating countries to face the possibility that continuation of international operation may depend on the finding of alternative ways of providing the necessary organization and of meeting the cost.

One method would be international financing through I.C.A.O., in which support would come directly from the states whose airlines made use of the airports and navigation services concerned; another would be to obtain revenue from charges for the use of airports and certain air navigation services. This is the subject of a special study by the Council of I.C.A.O. A partial solution of the problem would appear to lie in a combination of the two principles, since, in present conditions, neither can entirely relieve governments of financial burdens and responsibility for providing airports and services in their territories; nor can air tranport bear more than a fraction of the cost in conditions as they are at present. There is likely to be a long process of gradual adjustment rather than one all-embracing Act, and the conferences in London are important as a step in that process.

One conference discussed North Atlantic Ocean weather stations and a new agreement was drawn up for the maintenance of ten such stations in the North Atlantic Ocean. The original agreement made in London in 1946 established 13 stations, but was never entirely implemented. While there was technical justification for that number, the available resources in money and ships have necessitated the alteration of the scheme and three stations have been eliminated from the area nearest to the Azores; the rest will be re-located to give the utmost efficiency.

The agreement provides for certain financial adjustments be-

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tween European countries participating in the scheme in order to relate their contributions approximately to the benefits derived by their civil aircraft operating across the Atlantic. There is a reduction in the U.S. and Canadian commitments. Although the number of stations now actually manned is fewer than during the war, it is acknowledged that the ships have been of considerable use not only in providing communications and radio aids to air navigation, and as search and rescue points, but also in assisting operators in plotting courses to provide the most economical operation.

The conference on navigation services in Greenland and the Faroes dealt with an application from the Government of Denmark for financial assistance in maintaining the network of meteorological stations in the former and Loran in the latter. No assistance had previously been given to Denmark, which had established them on recommendations by I.C.A.O. regional conferences. The network of meteorological stations in Greenland covers ten stations extending as far north as 76 deg 36 min N. The Loran station at Skuvanes is the master station in the North-east Atlantic Loran chain. Although, in view of current extensive research into other long-range aids, this system is not recognized as a standard one by I.C.A.O., it is accepted for the time being.

It was agreed at the conference that the Council of I.C.A.O. should act on behalf of the contributory states in making an agreement with the Government of Denmark and supervising the operation of the scheme. The arrangements provide for the reimbursement to Denmark of her expenditure in the past up to an amount of approximately £425,000. As from January 1st, 1950, the contributing states have agreed to reimburse her for 90 per cent (about £185,000) of the costs each year. Contributions of participating states are related to the volume of their respective air-transport operations across the North Atlantic. Payment percentages for the current year, based on 1948 figures, are as follows: United Kingdom, 9.6; U.S.A., 51.7; Canada, 9.8; Netherlands, 6.3; France, 5.3; Sweden, 2.2; Iceland, 1.8; Belgium, 1.7; and Norway, 1.6.

The conference on air navigation services in Greece examined an application from the Government of that country for financial assistance in the rehabilitation of Ellinikon airport, Athens. A project to improve all services in Greece would involve capital expenditure of upwards of £1,000,000. While the Greek Government, with the aid of revenue from the airport, was ready to bear the cost of operation and maintenance, the states whose airlines operated through Greece were unable to give sufficient support to make practicable a plan for joint financing of the necessary improvements. An I.C.A.O. technical mission visited Greece in 1946 and again more recently. A schedule of requirements was provided for the conference from which it was obvious that if action is not taken soon, services into Greece will deteriorate and may even become unsafe to operate. A report will be compiled from data provided by states in the whole European-Mediterranean area on which the facilities in the region will be reviewed. This must be compiled before the Council can decide if there is reason for a general joint support policy.

The conference did not result in any agreement for international financing, but it did analyse the requirements for Greece and the factors on which future action on this particular case will depend.

SCHEDULED CARGO SERVICES IN U.S.

FOUR American air-charter companies specializing in the carriage of cargo have been granted permits by the Civil Aeronautics Board which virtually give them the same status as regular passenger and mail airlines. The Flying Tiger Line and Slick Airways, Ltd., have been authorized to fly regular trans-Continental services over some two-thirds of the country and United Air Lines have been authorized to fly on routes east of the Mississippi, while Airnews, Inc., may operate in Texas. Many other companies have applied for similar operating licences.

The Board has said that even in the absence of unusual technical advances, which would permit substantially lower rates, there is a potential domestic traffic for air freight of not less than 1,000,000,000 ton-miles year. The realization of that potential and its translation into actual air freight traffic is, of course, subject to such variables as economy factors, individual effort and competitive action. The Board expects the future operations of the air cargo companies to provide, amongst other things, a useful yardstick in determining the cost of freight haulage and other charges pertaining to cargo-carrying by air. Since the only operations to study are those of the registered passenger and mail airlines, the Board finds it virtually impossible at the present time to reach any conclusion as to costs. For such operations the companies received compensation and subsidy, so that cargo handling had been regarded only as a secondary operation.

Approval by the Board must be regarded largely as experimental but it has opened a wide field of general and unrestricted cargo operations to the American charter companies who may now draw up timetables and enter into contracts for future operations, advertise their schedules and do everything to promote business. This is an interesting development which will be watched with interest by British independent companies.

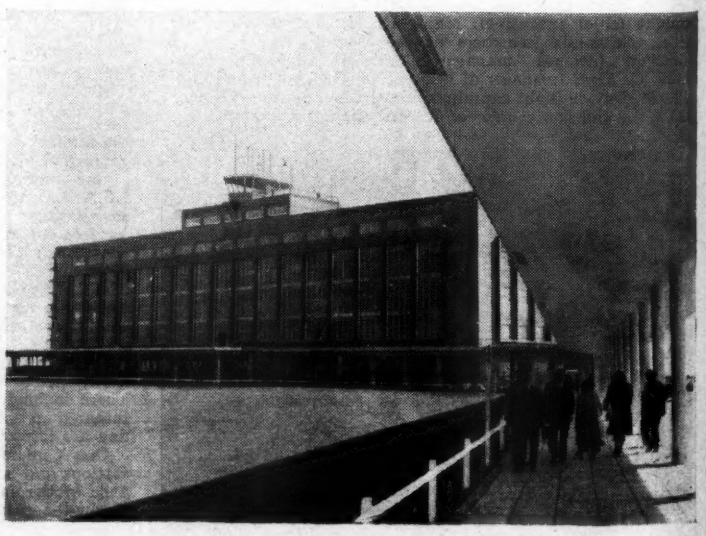
COLONIAL CIVIL AVIATION SERVICE

THE establishment of a Colonial Civil Aviation Service, recommended by the Colonial Civil Aviation Conference held in London in April, 1947, has been approved by the Secretary of State for the Colonies. The constitution of the new service will enable common standards of employment qualification to be laid down and will also afford wider opportunities for transfer and promotion to its members.

Final details of the posts to be included have not yet been settled, but they will fall into three groups. The first will include super-scale posts of special responsibility which will normally be filled by promotion from within the service, such as directors of civil aviation and their deputies, chief telecommunications officers and chief operations officers. The second group will consist of first-entry posts for which technical qualifications are required, e.g., operations officers, air-control officers, airport managers, senior signals officers, signals officers and assistant signals officers. The third group will comprise junior technical posts, e.g., radio operators and radio mechanics.

In general, salary scales will be related to those for posts of comparable responsibility in the territories concerned. The posts will normally be pensionable. When the final details have been settled the Colonial Office will issue full details of salaries, conditions of service, qualifications and methods of appointment.

As from to-morrow, May 20th, all United States "irregular" operators carrying passengers will be required to obtain permits from the Civil Aeronautics Board to continue their operations. Their cut-rate fares have taken considerable business from the scheduled services.



SOUTH AMERICAN AIRPORT: The terminal building at General Pistarinia Airport at Buenos Aires which was opened recently. It is said to be the largest airport in South America and facilities are contemplated for handling 180 aircraft daily. British South American Airways at present use Moron Airport for services to Buenos Aires.

BRABAZON RUNWAYS

THAT the Bristol Brabazon will be inoperable from any runway which falls below Filton standards in length, width and strength is, say the makers of the aircraft, an erroneous impression which has primarily arisen from the fact that the machine has been inseparably linked with the concurrent construction of the specially reinforced 1½-mile runway at Filton.

They point out that the Brabazon Mark II, the first aircraft of its class scheduled for airline service, will have two main undercarriage groups of multi-wheel bogies which will considerably reduce the severity of load effect on runways, and it has been found from a preliminary survey of airfields that the aircraft will be able to operate to and from many existing runways. Of 23 airfields on the North Atlantic and Empire routes only nine are believed to be below the required standard, and of these five are scheduled for improvement to Brabazon standards within the next few years. Among airfields which can be used are Filton, London, Schiphol (Amsterdam), Idlewild (New York), Orly (Paris), Shannon, and Washington. Tests are still being undertaken at Prestwick, Keflavik (Iceland) Tengah (Singapore) and Sydney. As information on other airfields becomes available the list will probably be extended considerably. The Brabazon may thus encompass, virtually, all major air routes in the world.

AMERICAN AVIATION SUBSIDY

THE United States Government has allocated £75,000,000 for subsidising the airline industry during the current financial year. This amount includes £25,000,000 for operating airmail services, whilst general air operations and the development of navigational aids and airports are covered by the balance.

This proposed subsidy is larger than ever before but the Government is of the opinion that the assistance required will gradually decline in the future. It is also considered that large sums spent on the development of airfields is of definite military value. The Board of the Budget responsible for this allocation takes the optimistic view that airlines will eventually bear a large part of their operating costs themselves but has made the observation that such subsidies should not be considered as gifts to benefit airlines only.

It has been stated that as the industry and the supporting activities of the Federal Government increase so it will become increasingly important to have a basis on which all the interested parties may appraise the cost in relation to the benefits received. At the present time this is said to be difficult because a major part of the airline subsidy is "buried" in mail payment to the operators. It has been suggested that the subsidy should be separated as payment for the carriage of mail, and as straight subsidy. Such separation would avoid the rather meaningless presentation of the American subsidy as it is at the moment and would end the false impression of postal expenditure which now results from the inclusion of the non-postal element in air-mail costs.

SANTA CRUZ TO BE DEVELOPED

THE Indian Government has announced that plans for the development of the Santa Cruz Airport, Bombay, have been prepared as part of a ten-year development programme costing £33,000,000. The airport will be equipped with efficient night-flying aids, including a modernized flare-path lighting system and a radio-range station. When the airport was built seven years ago it handled six services a day. Traffic at the airport increased after Karachi was partitioned to Pakistan until now 40 daily internal and foreign services operate through the airport. When fully developed, the airport will, it is hoped, be capable of handling aircraft of up to 200,000 lb.

CONSTELLATION PURCHASES

THE Government of South Africa has announced the purchase of four of the newest type of Lockheed Constellation 749 aircraft for use by South African Airways. The reason is said to be the desire to speed-up services between South Africa and the U.K. In March this year six additional Constellations were purchased by Air France and four by K.L.M. Two more were recently bought by Air-India International. These orders, together with additional aircraft for Eastern Air Lines, the U.S. domestic operator, bring the total sales of this type of aircraft to commercial airlines in the past eleven months to 23. Post-war sales, claim Lockheed, now total 179.

BREVITIES

THE new B.O.A.C. flying-boat base at Augusta, Sicily, is to be opened to-day, May 19th. The British Ambassador to Italy, Sir Victor Mallet, will attend the opening ceremony.

* * *

North-West Airlines, a U.S. domestic operator, will be the first to buy Stratocruisers for use on an internal route; the aircraft will be put into operation on the service between Chicago, Minneapolis and St. Paul during the summer. Ten are on order and delivery of the first is expected this month.

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Czechoslovakian Air Lines have suspended services to Israel as a result of the Greek Government's cancellation of permits for Czech aircraft to land or to fly over Greek territory. No air agreement exists between the two countries and Czech aircraft have to obtain permission for each landing in Greece.

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The twenty-ninth anniversary of the first K.L.M. flight—between London and Amsterdam in a converted de Havilland aircraft with two open cockpits—were marked by the official opening on May 17th of the new station buildings at Schiphol Airport. On May 29th K.L.M. will open a new route from Amsterdam to Curaçao, through Glasgow, Newfoundland, Canada, and Cuba.

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Mr. G. S. Lindgren, Parliamentary Secretary to the Ministry of Civil Aviation, introduced the Airways Corporations Bill in the House of Commons on April 11th. The bill is "to provide for the merger of the British South American Airways Corporation with the British Overseas Airways Corporation; to authorize the appointment of an additional Deputy Chairman of the British Overseas Airways Corporation; and for purposes connected with the matters aforesaid."

* * *

A large number of agricultural shows is being held in various parts of the country, and Mr. N. C. Stoneham, of Stoneham and Kirk, 50, Bloomsbury Street, London, W.C.1 (technical and agricultural advertising consultants) has been investigating the demand by farmers for personal air transport to these events. He states that they have shown considerable interest, and he has also obtained details of some forty shows with nearby landing facilities. Mr. Stoneham now seeks the co-operation of charter operators willing to pick up parties of from two to six farmers at the nearest convenient landing-grounds to their farms.

* * *

Capt. J. T. Percy has been appointed officer-in-charge of training for B.O.A.C. Atlantic crews at Filton, Bristol. He will be responsible for training the former Return Ferry Service Liberator crews for the Constellations and, in a few months' time, the crews for the Boeing Stratocruisers.

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The Swissair service to Cairo and Basra now operates once a week from Geneva as well as from Zurich. Calls are made at both Cointrin (Geneva) and Kloten (Zurich) on the outward and inward journeys, instead of alternatively at the two airports. This is also the case with the New York service inaugurated on April 29th.

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On May 6th Canadian Pacific Airlines took delivery of the first of four Canadair Fours—two months ahead of schedule. These aircraft are for use on the new trans-Pacific services to Australia, and the Far East, which will be inaugurated on July 13th from Vancouver and July 22nd from Sydney. The route will be San Francisco, Honolulu, Canton Island and Fiji, with connecting services between New Zealand and Fiji. Flying will be done only during daylight hours, night and sight-seeing breaks being made at Honolulu and Fiji.

* * *

From to-day, May 19th, Air France's twice weekly Paris-Lisbon service, which has been stopping at Bordeaux, will be flown non-stop on the outward trip; the service will leave on Thursdays and the return trip on Sundays. The Saturday outward and Friday return flights will continue to call at Bordeaux. By Languedoc aircraft, the non-stop flight takes five hours ten minutes. On May 31st a new Languedoc service is to be opened between Paris, Basle and Vienna, taking five and a quarter hours, and on June 1st a stop at Milan will be introduced on the Paris-Rome Constellation service.

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Four captains and two radio officers flying with B.S.A.A. have recently completed a million miles of flying. They are

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Capt. D. A. Cracknell (Operations Superintendent), Capt. S. B. Cliff (Senior Captain, Caribbean Area), Capt. E. L. Gosling, Capt. E. T. Kippenberger, Chief Radio Officer R. W. Chandler and Radio Officer A. M. Ruthven.

* * *

A.O.A. are to open a new booking office in Frankfurt, on the premises of the Visitors' Bureau. The building is due to be derequisitioned shortly, but the new offices will not open until December because of the need for alterations and decorating. The present office will be returned to the U.S. Army and the Visitors' Bureau will move to the Excelsior Hotel.

* * *

From June 18th to July 9th John Mahieu Aviation, the Belgian company, will operate a weekly return service Brussels - Le Zoute - London (Gatwick Airport). On July 16th the service on this route will be increased to a daily return flight, and there will be an additional daily return flight between Le Zoute and London. Fares from London to Brussels will be £7 7s single and £12 12s return; and from London to Le Zoute, £5 12s single and £10 2s return.

* * *

The American Air Transport Association, which represents the scheduled airlines in the United States, is making efforts to secure repeal of the 15 per cent tax on passenger fares and the 3 per cent tax on cargo rates. It is estimated that the 15 per cent reduction would do more to increase airline passenger traffic than the airlines could hope to do by other means. It is also suggested that Congress should try to modify the State petrol taxes, which were designed primarily to pay for the upkeep of highways.

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It was recently announced in Canberra that the major Australian airlines will increase their fares by about 20 to 40 per cent (according to distance and route flown) to counteract steadily rising costs. It was claimed that Australia's air fares would still be the cheapest in the world.

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Solar Air Services, Ltd., are operating flights to the Empire Trophy Race in the Isle of Man on May 26th. Aircraft will leave Croydon or Hendon airports at 1000 hr, returning at 2000 hr. The return fare is £14. For journalists and officials special flights will be made on May 23rd, returning on the 27th.

* * *

Nine B.O.A.C. captains recently returned from a conversion-to-type course in Canada on the Canadair aircraft. The party was headed by Capt. C. B. Houlder, who is to be in charge of training other B.O.A.C. aircrews in Britain in the operation of the new airliner. The Montreal training consisted of technical lectures and a flying course and part of the captains' time was spent in flying as supernumeraries on the T.C.A. service between Montreal and Winnipeg.

* * *

Six Dakotas were recently used by Hollywood to take film artists and technicians each day to a location site a hundred miles away. To cover personnel and equipment, the film company took out an insurance policy for each aircraft-load up to a maximum of a million dollars. Such a service has opened a new field of possible locations up to 250 miles from Hollywood previously considered impracticable because of the lack of housing accommodation within reasonable distance.

FROM THE CLUBS

ON May 1st, F/L. F. A. Dismore, D.F.C., assumed management of the Air Touring Department at the Royal Aero Club Aviation Centre in succession to F/L. D. E. de la Hoyde. The latter, who joined the staff of the Royal Aero Club in 1946, has now obtained a permanent commission in the R.A.F. Mr. C. Colin Cooper has also joined the Air Touring Department and is engaged in work relating to air rallies, races and records; incidentally, he should not be confused with Mr. H. J. Cooper, the manager of the Library, Press Section and Information Bureau and Editor of the Royal Aero Club Gazette. The telephone numbers of the Air Touring Department are Regent 3050 and Grosvenor 1246, Ex. 23: that of the Library is Grosvenor 1246, Ex. 25.

* * *

THE North of Ireland Aero Club has taken a bold step to establish itself permanently and develop interest in flying at Newtownards. Founded in 1936, the Club was greatly assisted by the late Lord Londonderry, the first president, and was just beginning to find its feet when war broke out. After the war Newtownards Airport was used mainly by Ulster Aviation, Ltd., whose managing director, W/C. T. W. T. McComb, O.B.E., did much to help the Club to restart. Ulster Aviation recently moved most of their aircraft away from Newtownards, and at a meeting of all members of the Club it was decided to lease the airfield. The assistance of a number of enthusiastic businessmen was enlisted and plans are now being drawn up to make Newtownards a centre for flying and other sporting and social events. The revenue will be used to subsidize flying and so to reduce charges. One light aircraft has been purchased and the immediate object is to double the present membership of 150.

MALAYAN ACE: A Chrislea Series II Super Ace has been purchased by the owners of a Malayan estate and is due to leave England this week. The photograph shows for the first time the wind-driven generator in the leading edge of the wing, whip aerial of the V.H.F. radio aft of the cabin, and the radio and battery access door in the starboard side.

M.C.A.-APPROVED FLYING COURSES

ON the occasion of a recent visit by Mr. G. S. Lindgren, Parliamentary Secretary to the Ministry of Civil Aviation, to the Orkney Flying Club, he was asked whether the Tiger Moths which might become surplus to R.A.F. requirements would be made available to the clubs. Although, apparently, he was unable to give a direct answer to the question (which would be also the concern of the Air Ministry), he indicated that the M.C.A. was considering the possibility, though he felt that the Tiger Moth was not an economic aircraft for club use; owing to its comparatively high-powered engine it was expensive to operate.

This can, presumably, be taken as a semi-official view; but it is to be hoped that since the Tiger Moth already forms the backbone of club activity, the flying schools and clubs will be given the opportunity of putting the surplus aircraft to further use.

Mr. Lindgren was also approached on the Air Navigation Regulations, particularly those concerning the number of hours required for Private Pilot Licence qualification. He said that students taking approved courses would be required to fly only 30 instead of 40 hours.

The Ministry has published pamphlets M.C.A. P.53 (6d) on *Student Pilot Licences*, M.C.A. P.55 (9d) on *Senior Commercial and Airline Transport Pilots' Licences* and also M.C.A. P 56 (6d) on *Instrument Rating for Pilots*. These publications describe in detail the training necessary to qualify, and on them the schools and clubs will be required to base their syllabus. Establishments wishing to provide courses acknowledged by the M.C.A. will be required to submit each syllabus and to permit inspection of their equipment and instructors. If, after the official investigations have been made, it is decided that an establishment reaches the required standard, then M.C.A. approval will be given. A list of such schools and clubs will be promulgated.

CANADAIR NORTHROPS

Licence Acquired for Production of Utility Transport

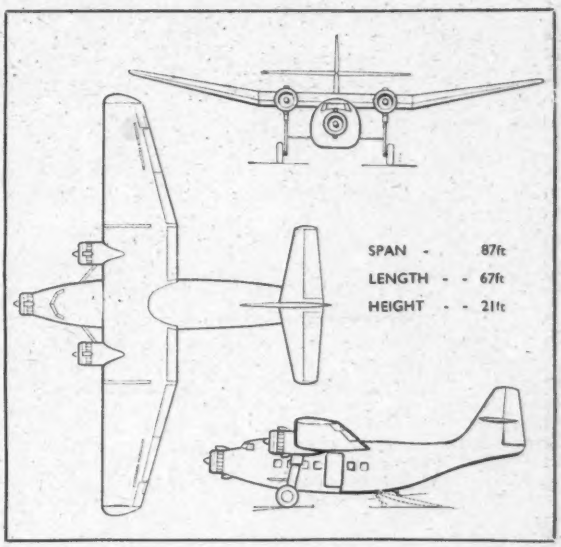
AS briefly reported in last week's issue of *Flight*, Canadair, Ltd., of Montreal, has entered into a licence agreement with Northrop Aircraft Inc., for production in Canada of the three-engined Northrop Raider. Although this "assault transport" was developed as a military version of the earlier Pioneer commercial cargo aircraft, Mr. Oliver West, the president of Canadair, has indicated that the Raider design has civil applications. In a statement announcing the agreement, Mr. West expressed the belief that this combination of Northrop's engineering talents and Canadair's proven production and sales abilities would benefit many of the world's airline, charter and military transport operators.

Details of the agreement are described as "exceptionally broad." As well as building, supplying and servicing Raiders for all available markets, other than the United States, Canadair has the right to develop the basic design. Northrop, it is stated, will assist the Dominion concern in an engineering consulting capacity, and further specific agreements are expected.

Designed for operation in and out of small and poorly surfaced airfields, the Raider is of all-metal construction and has a heavy-duty fixed undercarriage. Provision is made for conversion to floats or skis. A ramp-type door is situated in the under-side of the fuselage and forward of the door is a tail-wheel mounted on a combined oleo-leg-cum-jack which hydraulically raises the tail to facilitate loading. Measuring 9ft wide × 24ft long × 1½ft thick, the ramp door enables vehicles to be driven straight into the semi-monocoque fuselage. The cargo hold is stressed to take a useful load of 12,838 lb, and has a capacity of 2,290 cu ft.

"Family" design features incorporated in the Raider include retractable ailerons, permitting full-span flaps, as employed by the Black Widow. The Raider's tall single fin and rudder, with high-set tailplane, bears a close resemblance to the tail unit of the Northrop Scorpion night fighter, which, incidentally, is believed to have the same all-up weight (32,500 lb).

With three 1,200 h.p. Wright R-1820-97 nine-cylinder radial engines, the Raider has a maximum speed of 210 m.p.h., cruises at 164 m.p.h., and has an initial rate of climb of 1,325ft/min. Hamilton Standard fully feathering, reversible-pitch airscrews are fitted, and assist in shortening the landing run to 230ft at 23,000 lb weight. It has been estimated that the Raider's take-off run of 560ft would be decreased to 490ft by the installation of 1,425 h.p. Wright 1820-76 engines. Other performance figures would, of course, benefit correspondingly. Total fuel capacity is 1,800 gallons.



At the Northrop plant at Hawthorne, California, 23 Raiders are being built to a U.S. Air Force order. Of these, ten will be used for Arctic rescue, while the remainder will be employed in the development of the "assault transport" technique. This is thought to offer a more flexible method of landing troops and equipment in battle areas than is possible with gliders, and with less wastage. With the robust construction and ease of maintenance essential for such a duty, and with a capacity, in civil form, for over 30 passengers, the Raider appears likely to prove attractive to many operators.

C.U.A.S. ENTERTAINS C.A.S.

WITH customary high spirits the Cambridge University Air Squadron, at its annual dinner at the University Arms Hotel last Friday, entertained some distinguished guests. They included the Chief of the Air Staff, Lord Tedder; Air Marshal Sir Alan Lees, A.O.C.-in-C. Reserve Command; and Mr. S. C. Roberts, M.A., Vice-Chancellor elect and Master of Pembroke College.

W/C. C. H. Simpson, the Commanding Officer, in proposing "The Guests," referred to the new headquarters which would shortly be opened in the town, and for which the co-operation of Mr. R. H. Melville, Assistant Under Secretary of State for Air, was largely responsible. The Squadron had a full house, said W/C. Simpson, and there was now a waiting list. He had no "moans" except, of course, the hardy post-war annual about the type of aircraft they were flying; he reminded his listeners that before the war, as a member of the Squadron, he flew larger and faster aircraft.

Mr. Roberts congratulated the Squadron on its freedom from superstition in choosing such a date for its gala night. He raised many laughs by his own interpretation of some of the terms used by W/C. Simpson, particularly a reference to the C.A.S., which he interpreted as the Cambridge Antiquarian Society.

Lord Tedder proposed the toast to the Squadron and capped the Master's joke by referring to himself as the Chief Aunt Sally. He went on to administer a characteristically amusing reprimand to the Commanding Officer for raising the question of equipment at such a function, and further suggested that since it was an administrative matter it should be dealt with through the usual channels to enable it to reach the correct Civil Service department, from which it would never emerge. Lord Tedder hoped that the Squadron House was full of good-quality material—in fact, that the full house was "aces" or at least "kings high." He attached great importance to the University Air Squadrons, particularly in the training of true leaders. In its broadest sense the quality of leadership was to be fostered and in that direction the squadrons had a great responsibility. To achieve that end he urged maintenance of the highest standard. Mr. Roberts, said the C.A.S., had light-heartedy inferred that flying was an ungentlemanly affair, but he would remind him that, as in the cases of other pursuits flying had suffered through its close association with war, which was not a gentlemanly pursuit. We were often, he thought, in danger of applying gentlemanly actions to warfare, but sound judgment was more important than ethics.

Mr. I. S. Lloyd, B.A., replying for the Squadron, described in vivid detail a replacement aircraft for the Reserves. It was, he alleged, a Nene Tiger, code number DH 82A, Mk 301, and a striking example of the ability of an intrinsically outstanding design to withstand continual modification.

NEW INSTRUCTOR AT HAMBLE

INTENSIVE instruction continues at Air Service Training, Hamble. The demand has increased so much recently that three new flying instructors have had to be engaged; they are F/L.s E. W. Curtis, R. O. Whitehead and P. F. Middleton. F/L. Curtis, until recently, was a captain with Norwegian Airlines; during the war he was an instructor. F/L. Whitehead was a fighter pilot and subsequently an instructor; recently he was employed as C.F.I. at the Hampshire Aero Club. F/L. Middleton had a versatile Service career, and for seven months was in charge of Field-Marshal Montgomery's H.Q. Flight. Latterly, he has been employed with the Lancashire Aircraft Corporation, Ltd.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

PIONEER SQUADRONS

Last Word for an ex-C.O. of No. 1

AT the risk of boring you and being accused of flogging dead horses, I must point out to "Fitter II E" (April 28th) that I made no comparison between Nos. 2 and 3 Squadrons.

I referred to *the* premier squadron of the R.F.C.—which is, of course, *the* premier squadron of the R.A.F.

Perhaps if I were to breathe the words: "In Omnibus Princeps" he would understand. I must accuse him, therefore, of being "in nubibus"! H. R. ALLEN, S/L.

The Hague, Holland.

[We consider the horse, if not dead, at any rate unfit for further punishment.—ED.]

ENGINE NACELLES

A Reader Questions Departure from the Underslung Position

THE various artists' impressions, and photographs of models, depicting the Bristol 175 have shown the engine nacelles to extend appreciably above the top of the mainplane, in so far that at least half of the nacelle appears to protrude above the upper surface of the wing.

I have always been under the impression that the most efficient mounting for the engine was the "underslung" position beneath the main plane, or, in other words, an installation similar to that in the Lancaster, Mosquito, Ambassador, Hermes, York, and Bristol Freighter.

Whilst I realize that the Ambassador and Freighter are high-wing monoplanes which do not present limitations in airscrew ground clearances, I should be grateful if some information could be forthcoming explaining the proposed installation in the 175, because it would appear that the protruding nacelles must upset the aerodynamic characteristics of the wing surfaces. Is there a special reason for this type of installation or have ideas on the subject altered?

Clifton, Bristol. LEONARD THORNHILL.

[The aircraft named by our correspondent is not the only example in which such an arrangement appears. There are a number of conditioning factors which may justify it, such as considerations of undercarriage-stowage.—Ed.]

WATER WITH IT

An Arguable Point About Flying-boat Take-offs

IN your May 12th issue, when referring to the Sunderland's sorties on the Yangtse, it is stated that the flying boat "was forced to take-off down-wind, and down a 7-kt current." This appears to me to infer that the current is regarded as an adverse factor, and although in fact that may well be true, so far as I am able to reason the opposite would appear to be the case.

As I see it, the down-wind current would be the equivalent of a 7-kt head wind relative to the aircraft in still air conditions of take-off. That is to say, assuming, for example, that the down-wind velocity was, in fact, 14 kt, it means that this was effectively reduced to 7 kt.

I believe it is true that, in taking-off, a flying boat gets "up on the step" and, hydrodynamically speaking, is ready for take-off some time before it actually does part company with the water. With the aircraft having risen up on the step, drag is reduced to a nominal minimum, and the power is then available further to accelerate the aircraft to take-off speed.

Thus it would appear that the sooner the hull can be lifted to the planing position, the sooner will the take-off be effected, for although the "step" to take-off interval will be the same, the overall time will be reduced. The effective reduction of down-wind disadvantage given by the 7-kt current should surely, to my way of thinking, reduce the time between starting and planing.

I should be happy to have my views of this (apparently) controversial point either upheld or disproved. It would seem all to depend on how much help is given by wing lift in getting the hull up on the step. BARRIE ALDBURY.

London, W.1.

AERONAUTICAL ENGINEERS

"Redundancy . . . a By-word in B.O.A.C. and B.E.A."

BRITISH Civil Aviation is being bled white of the skilled aircraft engineering workers without whom we shall soon find it impossible to operate an efficient air-transport industry.

Most people in the industry know that redundancy has become something of a by-word in B.O.A.C. and B.E.A., and, speaking for myself, I know that I have had to find jobs for hundreds of people paid-off by these two corporations. By this means, the hard core of skilled workpeople has been kept in the industry, but I very much fear we have reached a period when this action will no longer be possible. Already I know of several engineers—some of them holding extensive licences, and some with 10 or 15 years' constant civil aviation experience behind them—who have in the last few months left aviation for good and have gone into such jobs as those of ice-cream machinery mechanics, motor mechanics, marine engineers, and so forth. The worst part of it is that they are unanimous in that, having got out of the madhouse which is British civil aviation, they would not come back into it at any price.

Just now, I am considering the probable effects of the ending of the Berlin Air Lift. This operation has employed hundreds of personnel and, if they are returned to this country, there are just not enough jobs to absorb them under the present state of affairs.

I do not want to make any suggestion to the Government department which could probably solve this problem; indeed, if I did, you may rest assured that whatever I suggested would be carefully filed at Ariel House under the heading of "Suggestions not to be adopted at any cost." The point is, unless something is done, and done promptly, the air transport industry in this country will degenerate to an even lower stage of bedraggled improvization. J. H. STEVENSON,

Croydon, Surrey. General Secretary,
Aeronautical Engineers' Association.

FORTHCOMING EVENTS

May 21st.—Northamptonshire Aero Club: 21st Anniversary Air Display.
May 21st.—Aero Golfing Society: Summer meeting and "Flight" Trophy. Ashridge Course.
May 26th and 27th.—National Physical Laboratory: "Open Days" May 26th for representatives of industrial organizations and May 27th for members of university staffs and government departments.
May 28th.—Wolverhampton Aero Club: "At Home" and Air Display.
May 29th.—Leicestershire Aero Club: Air Day and "At Home," Ratcliffe airfield.
June 1st.—R.Ae.S. (Luton): Discussion evening.
June 1st.—R.Ae.S. (Weybridge): Annual General Meeting.
June 4th to 6th.—Bembridge and Sandown Aero Club: Flying Week-end.
June 4th-6th.—Aero Club d'Epernay: Third International Air Rally. (Private invitations.)
June 11th and 12th.—Royal Air Forces Association: Annual Conference, Margate.
June 11th to 17th.—R.A.F. Small Arms Association: the 23rd Annual Championship Meeting.
June 11th.—Darlington and District Aero Club: Air Display, Croft airfield.
June 11th to 13th.—Yorkshire Aeroplane Club: International and Club Invitation Rally.
June 12th to 19th.—Italian International Air Week, Rimini and Venice.
June 16th to July 2nd.—Royal Tournament, Olympia.
June 18th.—R.Ae.S. (Brough): Flying meeting and Cirrus Trophy race Brough.
June 18th and 19th.—Aero Club de Basse Normandie: Flers de l'Orne Rally.
June 19th.—Air League of the British Empire (Portsmouth): Garden Party, The Airport, Portsmouth.
June 22nd to 24th.—Institute of Transport: Congress at Buxton.
June 26th.—Northern Heights Model Flying Club: Gala Day, Hawker airfield, Langley, Bucks.
June 26th to July 3rd.—Aero Club d'Italia: International Air Week, Milan.
July 1st.—R.A.F. Golfing Society: Summer Meeting at Moor Park Club, Herts.
July 2nd.—R.N. Air Station, Lossiemouth: "Open Day" and Flying Display.
July 2nd to 4th.—Royal Aero Club: Private air rally at Deauville. Guests of M. André.
July 2nd to 10th.—Tour de France Aérien.
July 4th to 11th.—Royal Aero Club: Private Air rally to Spain.
July 9th.—Redhill Flying Club: Garden Party.
July 16th and 17th.—Royal Aero Club: Private air rally at Le Baule, St. Nazaire. Guests of Mme. André.
July 23rd.—"Daily Express" Air Pageant, Gatwick Airport.
July 30th to Aug. 1st.—King's Cup Race and National Air Races, Elmdon Airport, Birmingham.

SERVICE AVIATION

LAND-BASED MARINER: The lines of the Avro Shackleton G.R.I. are shown to advantage in this pleasant new study of the prototype, secured during a recent test flight. Requirements of Coastal Command, for which the type is now in production, have been carefully studied in the design of the Shackleton.

R.A.F. Appointments

THE Air Ministry announces that A.V-M. T. G. Bowler, C.B.E., formerly A.O.C. No. 40 Group, Maintenance Command, is to become Senior Air Staff Officer to the H.Q. of the same command. He is succeeded by A.Cdre. L. J. V. Bates, C.B.E., who takes the acting rank of Air Vice-Marshal, and was, until recently, Director of Equipment (D) at the Air Ministry.

Conference "Ariel"

THIS year's annual R.A.F. Staff exercise, held by the Chief of the Air Staff, Marshal of the R.A.F. Lord Tedder, takes the form of a conference on manpower. Some 200 civil representatives and a similar number of senior R.A.F. officers are taking part in the conference, which has been given the code-name of *Ariel*. It began yesterday at the Royal Empire Society's building in Northumberland Avenue, London, W.C.2, and was preceded by a two-day meeting devoted solely to Service affairs.

Formation of future policy is not a function of the conference, which is intended to make possible a frank and confidential exchange of ideas on a problem which has become of increasing importance in the light of the nation's limited manpower resources. An exhibition is also being staged in conjunction with the conference, to show pictorially to the civilian representatives—who include members of Government departments, industrial, educational and welfare associations—the work and training of the various trades. The officer responsible for organizing Conference *Ariel* is Air Chief Marshal the Hon. Sir Ralph Cochrane, the A.O.C.-in-C., Flying Training Command.

Royal Air Force and Naval Aviation News and Announcements

F.C.U. Age-limit Raised

EX-SERVICE men up to 45 may now join Fighter Control Units of the R.Aux.A.F. The previous upper age limit was 38. Volunteers are still needed for these raid-reporting units, especially those with experience of radar, wireless and aircraft control.

New R.A.F. Trade

THE trade of "tracer" is now being introduced into the R.A.F. Tracers will, if unqualified, receive eight weeks' training "on the job" for drawing-office duties not requiring specialist knowledge.

Back to Belfast

AFTER a month in dry dock at Liverpool for inspection and painting, the 36,800-ton carrier *Eagle* recently returned to Belfast, where her builders, Harland and Wolff, Ltd., will install armament.

Accident-Prevention Tour

FOLLOWING visits to units of B.A.F.O., Germany, a mobile accident-prevention exhibition will on May 26th begin a tour of the Netherlands. From June 5th to June 10th it is due to visit Belgian Air Force units. The exhibition is similar to those seen frequently at home and overseas R.A.F. stations, and will be accompanied by S/L. T. A. Cox, D.S.O., D.F.C., as lecturer.

Scottish Naval/Air Display

THE Royal Naval Air Station at Lossiemouth, Morayshire, will be open to the public on Saturday, July 2nd, for an air display and static exhibition. A similar occasion two years ago drew a crowd of 4,000 people. The programme will include flying demonstrations by Naval pilots, a static exhibition, and, possibly, joy-rides for the public. All proceeds will go towards the Navy Week's Trust Fund.

Gunners' Summer Camps

THE R.A.F. Anti-Aircraft Gunnery School at Watchet, Somerset, will be this year's training camp for R.Aux.A.F. Regiment Light A.A. Squadrons. No. 2501 (County of Gloucester) Squadron will take its own 40 mm guns to camp, but other units will use guns provided by the School, carrying their Piats and personal arms only. The training programme includes ground-to-air firing against drogues towed by aircraft and air-to-sea firing on targets towed by marine craft.

R.A.F. Permanent Commissions

THE following officers have been selected for permanent commissions in the Royal Air Force, in the branches shown:

GENERAL DUTIES BRANCH.

Wing Commander: C. A. Vernieux, D.F.C.

Squadron Leaders: W. S. Chubb, A.F.C. P. J. T. Stephenson, D.F.C.

Flight Lieutenants: A. Barrell, L. A. T. Best, D. Gray, K. Ruskell, D.F.C.

Flying Officer: W. E. A. Snelling.

TECHNICAL BRANCH.

Flight Lieutenants: S. H. Bates, M.B.E., E. F. Chatt-Collins, R. W. Hodder, S. A. H. King, E. W. Lamb, J. Satchell, R. V. Stirling.

Service Aviation . . . . .

Flying Officer: S. J. Stephens.
EQUIPMENT BRANCH.
Flight Lieutenant: S. J. Andrews.
SECRETARIAL BRANCH.
Squadron Leader: P. J. R. Lee.
AIRCRAFT CONTROL BRANCH.
Flying Officer: A. G. M. Butt.
MARINE BRANCH.
Flight Lieutenant: H. C. Field.
MEDICAL BRANCH.
Wing Commander: L. V. McNabb, M.B., B.S.
PROVOST BRANCH.
Squadron Leaders: H. V. Seal, R. Scott.
PHYSICAL FITNESS BRANCH.
Squadron Leader: G. T. James, A.F.C.

Reunions

FOR details of a proposed reunion in London of No. 195 Bomber Squadron, R.A.F., ex-members are asked to write to G. Lubin, 159, Cranbrook Road, Ilford, Essex.

* * *

Former personnel (all ranks) interested in an East Africa flying-boat reunion are asked to write, giving squadron numbers, to J. Needham, The Old Granary, Stratfield Saye, Reading, Berks.

More Jets for Auxiliaries

IN addition to No. 500 (County of Kent) and No. 605 (County of Warwick) Squadrons, which received their first Meteor 3s and Vampire 1s, respectively, nearly 12 months ago, No. 501 (County of Gloucester) and No. 616 (South Yorkshire) Squadrons have begun re-equipment with jet fighters. No. 500 Squadron now has its full establishment of aircraft while the other three R.Aux.A.F. Squadrons will shortly complete their re-equipment. Vampires were delivered during February to 501 Squadron, while 616 Squadron began its conversion to Meteor 3s last December.

Plans for further re-equipment were announced by the Air Minister on May 12th. By April next year, Nos. 601, 604, 608 and 504 Squadrons will all have been provided with jet fighters, and it is hoped that before March, 1952, the remaining 12 squadrons will be similarly re-equipped, as aircraft and airfields become available.

AUSTRALIAN OCCASION: Air Marshal G. Jones, Chief of Staff of the Royal Australian Air Force, is seen (right) accepting, on behalf of the R.A.A.F., a painting which depicts the act of gallantry for which F/S. R. H. Middleton was posthumously awarded the Victoria Cross. The work was commissioned by members of 149 Squadron, Mildenhall (with which F/S. Middleton served) and was executed by A/C. Smith (second from right).

PLAINFARE SUMMING-UP

Air Minister Reviews R.A.F. Achievements in the Air Lift

FOR some time to come, aircraft of the R.A.F., U.S.A.F. and British civil concerns will continue to fly food and fuel into Berlin. Final arrangements for the ending of the Air Lift have yet to be decided; the situation has political aspects, apart from the necessity of building-up stocks in the German capital, while road, rail and water transport returns to full efficiency. But with the lifting of the Russian blockade at midnight on Wednesday, May 11th, dire necessity for this unique air operation came to an end.

A few hours earlier, the Secretary of State for Air, Mr. Arthur Henderson, reviewed the history and achievements of the Air Lift, with particular emphasis on Operation *Plainfare*, the Royal Air Force contribution to the overall effort. He announced that, up to noon on Wednesday of last week, 195,530 round trips to Berlin had been completed by the combined task force, carrying a total of 1,583,686 short tons (a short ton is 2,000 lb) of freight. The British share, represented 49,733 return flights by R.A.F. aircraft and 13,879 by civil charter machines, which were together responsible for carrying 369,347 short tons of supplies. Approximate totals of sorties made by the individual types of Service aircraft were: Yorks, 25,500; Dakotas, 20,500; Hastings, 2,350; and Sunderlands, 1,000. Present *Plainfare* strength consisted of 40 Yorks, 40 Dakotas, 14 Hastings, and 35 four-engined civil transports, while the *Vittles* (U.S.A.F.) fleet was approximately 200 Skymasters.

Mr. Henderson said that while *Plainfare's* contribution was little more than a quarter of the total flights and tonnage of the Air Lift, the bulk of the ground organization had been British. Six of the eight despatching airfields were in the British Zone. He emphasized, however, that the Lift had been an Anglo-American affair in every sense. Co-operation between the Air Forces had been as close and as friendly as in wartime.

On June 28th last year *Plainfare* began, when 13 R.A.F. Dakotas carried 40 tons to Gatow. The original target had been 750 tons a day, but by mid-August the average had reached 1,200 tons daily; all daily records were broken when, by noon on May 11th, 2,182 tons had been carried in 24 hours. Australian, New Zealand and South African crews, who joined the Lift in September, had made over 3,000 sorties.

Many Lessons Learned

One of the most encouraging sides of the operation was the practice afforded to Service aircrews in instrument flying and approach procedures in all weathers. At Gatow, 8,000 landings were made with the aid of G.C.A. There had also been, said the Secretary of State, useful experience in the field of air-traffic control, and great credit was due to both planning staffs and aircrews for the successful organization and operation of the traffic patterns. Thorough testing had been made of the cross-bar approach lighting system developed by the R.A.E. and now installed on three *Plainfare* airfields. Many of the lessons learned on the technical side would not be fully appreciated until complete statistics of the Air Lift had been studied, but, said Mr. Henderson, there was no doubt that we had gained much information on design requirements for future transport aircraft.

Magnificent work by ground crews, both in Germany and at home stations had proved the efficiency of the planned servicing system under high-intensity conditions. Members of the recently formed Airfield Construction Branch of the R.A.F. had also played an important part in *Plainfare*. At the peak of their activity they had handled 150,000 tons of constructional material in a week. Designed mainly for long-range route flying, the aircraft themselves had stood up well to the strenuous short hauls, frequent take-offs, climbs and landings at all-up weight. The way in which these difficulties had been met was also an indication of the flying abilities of our crews, and proof that R.A.F. flying training was the best in the world. In a total of nearly 200,000 take-offs and landings the R.A.F. had suffered only four fatal accidents.

In conclusion, Mr. Henderson described the Air Lift as the most outstanding transport operation in the history of aviation. The feeding of 2,500,000 people by air over a period of 10 months would, a few years ago, have been considered possible only in the realm of fantasy. It was further proof of the great contribution that could be made to the welfare of humanity through the medium of air transport.

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